AUGUST 2014 | #152 | £4 / €7 / $13

# develop

GAME DESIGN | CODING | ART | SOUND | BUSINESS

CREATIVE ASSEMBLY™

GATHERING THE GREATEST FOR MORE THAN 25 YEARS

CREATIVE ASSEMBLY™

## WE ARE THE CREATIVE ASSEMBLY

From our humble beginnings over a quarter of a century ago, we've grown steadily from a starting team of five, into one of the world's most admired games studios. Employing over three hundred amazing developers from all corners of the globe, our mission is to craft the greatest game experiences possible for our legions of fans.

Whether that's through the continued development and evolution of our multi-award winning Total War™ series, our work on console titles utilising our own internally developed, bleeding edge technology, or our high-profile collaborations with globally recognised intellectual properties such as Games Workshop's Warhammer® and Twentieth Century Fox's Alien™.

Could you make your own history with us?

### ACHIEVEMENT

We set ourselves very high standards here at CA, and you'll see that right across the business. From our class leading games, to the way that we run our development teams, even in how we connect with our community, you'll find this desire to be the best deeply ingrained into our culture.

### TRANSPARENCY

Our flat structure means everyone has a voice and our door is always open. Have an idea about improving a game feature? Want to see an exciting initiative implemented? We work hard to find amazing people to be part of our studio, so we feel it's vital to encourage a culture of trust to allow these incredible professionals the opportunity to challenge the status quo and suggest ideas and improvements to our games or workplace. It's this transparency that enables us to constantly evolve and improve as a team.

### PERSONALITY

Our people are our greatest asset and we want to help them grow both professionally and personally. That's why we're committed to training and development for all our staff, acquiring new skills, mentoring junior team members and being involved in the hiring process when we are looking to engage new talent.

Working at Creative Assembly is like being part of a family, and we want family members who want to stay with us, grow and shape their careers, making great games within a non-corporate, fun but hugely professional environment. It's no surprise that we have numerous staff who are approaching twenty years with CA, and are still as passionate as the day they joined us.

### AUTONOMY

We are wholly-owned by SEGA and work closely with our publisher, but we operate largely autonomously and like to do things a little differently from your average games studio.

Here at CA, we believe that an internally focused, unified development strategy is most effective and as such we've gone to great lengths to bring many key processes in-house. Whether this is providing a state of the art motion capture studio and high end recording suites, or building a large quality assurance team for instant testing feedback, or an in-house marketing department to work directly with the development team.

develop

ISSUE 152 AUGUST 2014

# INSIDE THIS ISSUE

15 - 31 >

**DEVELOP AWARDS 2014: AND THE WINNERS ARE...**
Check out our 17-page guide to the winners of this year's Develop Awards, with victory quotes and images from the nights – plus Development Legend Mark Cerny's inspirational acceptance speech

33 - 34 >

**THE LIFE OF PI**
In-depth look at Raspberry Pi

40 - 41 >

**MEDIA MOLECULE**
*Tearaway* dev on new IP

55 - 61 >

**MOTION CAPTURE**
Seven-page Build special

**REGULARS** Develop Diary **P09** • #DevelopJobs **P49** • Directory – Spotlights **P79** • FAQ **P82**

**ALPHA**

Epic Games UK revealed **P04**
*Unreal firm lands in Britain*
UKIE at Gamescom **P06**
Nick Gibson **P10**
*UK development data shared*
Alex Ward **P11**

**BETA**

Words of a Legend **P15**
*Mark Cerny on his award*
Develop Awards winners **P19**
Inside Raspberry Pi **P33**
Simulation Games **P38**
Opening Windows **P43**

**BUILD**

Tools News: Miles 10 **P66**
Guide: Animation tools **P68**
Key Release **P70**
Heard About **P72**
Unreal Diaries **P74**
Unity Focus **P76**

**EDITORIAL**

## PROUD TO BE IN GAMES

MARK CERNY'S DECISION to bring his mother to the Develop Awards was genuinely touching.

The PS4 lead architect, and this year's Development Legend, was originally bound for a very different career path (head to page 15 if you want to know more), and here he was offering a beloved family member a brief glimpse into a world far larger and prouder than many mothers may expect.

No doubt many attendees have struggled to truly convey the viability of video games as a valid career to their loved ones – certainly, my friends and family still tease me about playing games for a living (which, I keep assuring them, I don't).

So to see an industry veteran stand on stage and openly declare his love for his work and industry to someone who may not have fully appreciated it before was inspiring.

We should all take pride in what we have chosen to do. Ignore the usual *Daily Mail* crap and *Sun* scaremongering – many of the games that *Develop* readers create arguably bring more joy and revenue to the world than many of Hollywood's clichéd blockbusters or what passes for literature on the best-sellers list.

Maybe we'll have a few more mothers at next year's Develop Awards.

**James Batchelor**
james.batchelor@intentmedia.co.uk

# The UK just got Epic

Unreal Engine and Gears of War firm opens UK studio, integrates long-time partner Pitbull Studio into Epic operations

**by James Batchelor**

*Left to right: Epic Games' Tim Sweeney, Pitbull's Robert Troughton and UE4 devs James Golding, Ray Davis and Michael Troughton. Main: Epic Games UK's new office*

EPIC GAMES IS setting up shop in the UK, *Develop* can reveal.

The tools and development powerhouse, known for its popular Unreal Engine as well as blockbusters like the *Gears of War* series, has established a UK base of operations.

Epic Games UK will be led from a Sunderland branch – previously Pitbull Studio, which has become part of the Unreal firm. It will be supported by Pitbull's Leamington Spa office and a new workspace opening in Guildford.

The three offices will aid development on Unreal Engine 4, with the potential to contribute to games like *Fortnite*. Meanwhile, Mike Gamble will continue to run the UE licensing effort for all of Europe from his UK office, as he has been since 2011.

Founder Tim Sweeney says the UK is a key market Epic has long had its eye on.

"The UK has a rich history of games development, as well as a wide range of experienced developers," he told *Develop*.

"We're also attracted to the expertise in key areas like physics and lighting emanating from British universities such as Cambridge and Oxford.

"Right now, we're building a world-class talent pool in the UK to contribute to all aspects of Unreal Engine 4. Our aim at Epic is to provide the world's best and most versatile engine, scaling from indie mobile development to high-budget triple-A games."

## THE BRITISH CONNECTION

James Golding, lead programmer on Unreal Engine 4, told us the UK's talent base was a major draw for Epic Games, hoping the UK office will attract skilled developers from established studios and promising new graduates.

Golding, who is glad to be back on "home soil" after 12 years working at Epic's US HQ, also said the new UK location brings the Unreal firm closer to many of its key customers and partners.

"We have lots of users in the UK, including Lionhead, CCP, Rocksteady, and Ninja Theory, as well as elsewhere in Europe, such as Yager," he said.

"We really want to have a closer relationship with them, to better understand what they're doing, and to make their games and our tech as good as they can be.

"You need to be physically present to build a good relationship with the games development community here. Being in the UK means we can have frequent, face-to-face communication between our engineers and developers using or thinking about adopting UE4."

Ray Davis, general manager for Unreal Engine, added: "Having a UK studio helps us become a more meaningful and permanent member of the talented UK development community. We've been fortunate to have long partnerships with great studios located in England and with a presence in the same time zone we'll be able to reach out and support these partners to an even greater degree.

"We're also excited to get to know some of the smaller development groups that are springing up, and we're eager to start the conversation with them about how we can make UE4 the best development platform for their ideas."

## GREAT BULLS

Key to Epic Games' entry into the UK has been the acquisition and integration of Pitbull Studio, a long-time partner of the Unreal Engine creator.

"Pitbull Studio has been working with Epic Games for over three years now as an important development resource on several Epic products – most notably Unreal Engine, but also *Gears of War, Fortnite* and other projects," Pitbull's Robert Troughton explained.

*MD Robert Troughton and his team at Pitbull Studio have been brought into the Epic fold, now operating as Epic Games UK*

*While Epic Games UK will primarily work on Unreal Engine 4, there is scope for team members to help with games like Fortnite*

"Over the years we've increased our headcount to the point that we're making very significant contributions – it feels like we're already part of Epic. The integration of Pitbull as an Epic Games studio seems like a no-brainer for all of us. Everybody here is stoked this is happening, and very excited to see what comes next."

Davis added: "Pitbull's engineering talent has helped us build a better UE4 and given us more horsepower to keep moving forward. Not only have they brought great programming know-how to our efforts but they have also provided fresh perspectives and insights into how we can make our technology better. They've been a great partner in helping us bring UE4 to developers everywhere and we're excited to have them as officially part of the Epic family."

### EPIC EXPANSION

The move means a new role for Troughton, who will serve as general manager of Epic Games UK. In this position he will oversee UK operations, ensuring that local offices operate efficiently, recruit new people and work with UE4 devs around Europe.

"Essentially, I'm doing everything I can to make sure that Epic Games UK is a huge success and that it continues to be a valuable asset," he said.

"Unreal Engine 4 is already by far the best engine available for developers – and now, with a re-invigorated recruitment push aimed at only the very best talent that the industry has to offer, we can take this even further and accelerate the implementation of new features.

"It's a very, very exciting time to become part of Epic Games – and every single Pitbull employee is super excited to be a part of that."

As Troughton says, the creation of Epic Games UK has kicked off a new recruitment drive, bringing in fresh talent to help bolster the studio.

> ***"We're building a world-class talent pool in the UK."***
> Tim Sweeney, Epic Games

Among the newest additions has been Michael Troughton, who joins from the nearby Ubisoft Reflections as lead programmer. An industry veteran of 21 years, he has held a number of senior positions – most recently as director of technology at Reflections – and is keen to get to grips with the popular Unreal Engine.

"It's an incredible opportunity to work on the Unreal Engine 4 platform, pushing hardware to its screaming limits, whilst also empowering games creators with the tools to create the most fulfilling gameplay experiences," he told *Develop*.

"Epic is one of, if not the most forward-thinking games developers in the Western world. They're poised to really take advantage of their class-leading technology across a new gaming arena.

"We already have a hugely talented team, and I want to see Epic Games UK grow into one of Europe's premier development houses. I've worked in many areas of development in my career so far, and I intend to use that knowledge and expertise to continue to improve UE4's performance on every platform, from mobile devices to super-charged gaming PCs."

Golding adds that there are plenty of other opportunities at the studio: "We have UK-specific roles, including academic evangelist, community manager, support tech artist and programmer.

"Several positions on the Epic careers page may now be filled locally. If you think you have the skills and are excited about working for Epic in the UK, please do get in touch."

### ARE YOU EPIC?

As Sweeney and Golding both mentioned, Epic is looking for the best UK talent and its recent hires encourage more developers to apply.

"It takes a special kind of person to work at Epic," says Michael Troughton. "We want people looking to push the boundaries every day. You need to be exceptional in everything you do, driven and very self-motivated.

"In return you'll work in a great environment with extremely talented people, and contribute to ground-breaking tech and tools. Everyone here has a voice and can influence the choices made in the development of Unreal Engine 4."

Epic Games' expansion into the UK is a significant step for the company, and a testament to how big the tools provider and development behemoth has become.

The new UK base adds to a widespread empire of international studios, with Epic outlets in Poland, South Korea and Japan.

"Epic is not a high-growth company by nature, but at this point in 2014 we're expanding to meet the enormous opportunity we see with our engine and next generation of games," says Sweeney. ■

**You can check out the vacancies available at www.epicgames.com/careers**

## THE ENGINE BEHIND THE GROWTH

2014 HAS ALREADY been a big year for Epic Games. In March, the company launched Unreal Engine 4 – it's most powerful technology yet – with a drastically different business model.

Unreal subscribers are now able to access the engine – including source code and all of the tools Epic uses to make its own titles – for a low monthly fee. It's a bold move, but one that has more than paid off for the company.

"We've been amazed by the response to Epic's release of Unreal Engine 4's complete tools and source code," founder Tim Sweeney told *Develop*.

"A large and rapidly growing community has sprung up, developing all kinds of games, and also fuelling a new level of interest amongst triple-A developers."

Unreal Engine general manager Ray Davis added: "The response has been gone beyond anything we anticipated. Having a large audience of developers trying to build all sorts of diverse projects on the engine has generated a large amount of feedback, which we've in turn used to guide our development efforts for the next release.

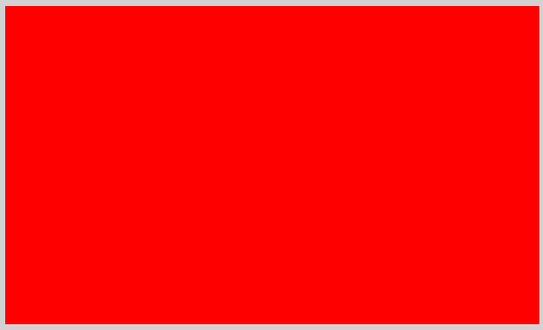
"We'll continue to listen to the community to evolve UE4 into a platform that's well-suited for building any type of game, and we'll continue to improve all of the aspects that are necessary to ensure a great development experience."

Epic Games already publishes its plans for UE4 at **unrealengine.com/roadmap**, where users are able to vote on future features. So far, interest has emerged in more mobile development support, as well as several requests around the UE4 Marketplace.

"We're working hard to enable that as we recognise the value it brings for smaller development teams looking for content or plugins to augment their projects," said Davis.

"Finally, we're continuing to invest in features that push the bleeding edge of what's possible on modern hardware, highlighting not only what today's leading consoles are capable of, but also hinting at what the next big step in games development will be."

**www.unrealengine.com**



*Unreal Engine 4 has benefited greatly from its new subscription model*

# Biggest UK industry stand yet set to occupy Gamescom

After tremendous success last year, UK trade body UKIE is hosting a booth at Gamescom 2014 that celebrates and showcases the best of the British games industry today. We take a pre-emptive tour of the seaside-themed booth

*UKIE has teamed up with UK Trade and Investment, which is behind the 'Great Campaign' for creative businesses, to grant devs money towards expo costs*

UK GAMES INDUSTRY trade body UKIE is again hosting a sizable stand at Gamescom that will gather together a spectrum of the region's developers, publishers, tech and service outfits.

This year some 53 UK games companies are exhibiting at the stand, which is conceived to engender networking, deal making, and showcase the best output of games firms from across the UK.

Occupying a significant space in Gamescom's business halls, the UK industry stand is bigger than ever this year, growing in unison with Gamescom and sister event GDC Europe, which together today deliver an event catching up with E3 in both size and status.

"When we first started in 2012 we had 23 companies exhibiting on the stand, which at the time was a record number of UK studios in attendance at the show," explains UKIE CEO Jo Twist.

"This year we have smashed that record and the stand will be home to over 53 British games businesses. Last year, UK companies did over £16m worth of business on the stand throughout the three days, and we are hoping that we can double that this year with VIP attendees visiting exhibitors on the stand, more networking opportunities and a streamlined meeting system."

**PIER-TO-PEER NETWORKS**

In keeping with expo tradition, this year the stand is themed to reflect culture peculiar to the UK, and as such is adopting a British seaside dressing.

"Every year we try to make the stand feel like a home away from home for UK businesses," says Twist. "Last year we had a fantastic pub garden theme, so we wanted to do something different this year. After much deliberation we have created this year's incarnation to resemble a British seaside, which will be complete with deck chairs, buckets and spades and a seaside photo board. This is going to be the biggest and best year ever for the UK games industry."

> ***"This is going to be the biggest and best year ever for the UK industry."***
>
> Jo Twist, UKIE

But sandcastles and pebbled beaches aside, the booth has a sincere and serious intent; to serve those exhibiting with more business, to present a detailed picture of the diversity and quality of the UK games industry today, and to provide attendees that visit the area a practical and efficient way to meet and work with games outfits from across the United Kingdom.

"The main thing the stand offers is that SME businesses have the opportunity to attend Gamescom at a heavily discounted rate and hassle free," states Twist. "Exhibitors have the opportunity to meet some key industry players that we organise to come and visit companies on the stand and all they have to do is show up and the UKIE team – this year aptly aided by four lucky volunteers from our Student Membership Scheme - take care of everything else.

"We keep you fed and watered throughout, organise, build and maintain the stand and act as an extension of your own team, ferrying your meetings to and from your space so that your time at the show runs as smoothly as possible. We also work with UKTI (UK Trade and Investment) to get a limited number of tap grants so businesses can get £1,500 towards their exhibition costs, which has made Gamescom accessible to companies that previously could not afford to attend. When you exhibit you also become part of a community that you are proud to represent and the stand itself is a networking hotbed."

**TRADE AND INVESTMENT**

UKIE has also partnered with UKTI on the stand, meaning the Government department devoted to promoting UK companies on the international stage will assist

## STAND TO DELIVER

AT THE TIME of writing, the 53 games companies with a presence at Ukie's Gamescom UK industry stand are:

Amiqus
Atomicom
Beatnik Games
Born Ready Games
Climax Studios
Cloudant
Dead Good Media
DeltaDNA
Evil Twin Artworks
Fat Pebble
Firebrand Games Publishing
Firefly
Focus
Four Door Lemon
GameSessions / Tangentix
GameSparks
Global Step
Greenman Gaming
ICO Partners
Ikinema
Improbable
Jelly Media
Kiss Ltd
Mastertronic
Multiplay
Mutant Labs
Ndreams
Oink / Virtual Piggy
OnLive
OPM
Osbourne Clarke
Player Research
Playmob
Pole to Win
Pqube
Redbedlam
Revolution
Ripstone
Rising Star
Secret Sauce
Sold Out
Steel Media
Super Micro
Tag Games
Team17
Tech Data
Testronic
Universally Speaking
University of West Scotland
Venatus Media
Waterfront Entertainment
Wired Productions
YoYo Games

more UK games outfits in networking with foreign investors, partners and the like. UKIE itself has arranged 121 meetings with UK exhibitors and large scale businesses, which UKTI is bolstering by providing other ways for studios to contact investors.

One such case will see UKTI host a visit to the stand by a delegation of South Korean firms with interest in the sector.

UKIE's work with UKTI has also seen more UK-made games added to the branding materials of the latter's 'Great Britain' campaign, meaning investors the world over in numerous sectors will, at various trade events – including Gamescom – see *Moshi Monsters*, *LEGO The Lord of the Rings*, *LittleBigPlanet*, *Worms* and *RuneScape* showcased as prime examples of national creativity in the UK.

The stand also serves as a place to enable individually organised and ad-hoc meetings, and attendees are encouraged to make contact with all the exhibitors (see boxout: '*Stand and Deliver*').

"The stand is a great place to meet a huge array of UK companies that are all ready to do business with you," says Twist. "Anyone is welcome to come and relax in our networking area, take in the seaside theme and play some games from UK developers. There is no reason to not drop by and check it out."

> ***"It's a great place to meet studios that are ready to do business with you."***
>
> Jo Twist, UKIE

**SPOTLIGHTING BRILLIANCE**

The UK industry stand is also supported by Unity, Amiqus, Born Ready Games, UKTI Germany, Global Step, Multiplay and Atomicon, the latter of which is partnering with UKIE to host the UK Game of the Show award, which strives to highlight the most deserving UK-made in-development title on display at Gamescom.

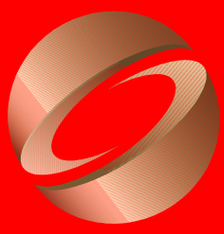
"The UK game of the show award is a great opportunity to showcase the UK's industry to a global audience," says Twist.

"The UK games and interactive entertainment industry is world-class. We make the biggest selling and most creative entertainment products, we have the right business environment and a fantastic blend of creative talent to make globally successful exports. The award is a way of shouting about this and helps demonstrate the fact that we are the best country in the world to both make and sell games and we are proud of it."

Those looking to visit UKIE's UK industry stand can find it in the business area, Hall 4.2, across booth areas A051 and B050. Gamescom runs from August 13th to 17th in Cologne, Germany. ■

**www.UKIE.org.uk**
**www.gamescom-cologne.com**

ARM®



SIGGRAPH2014

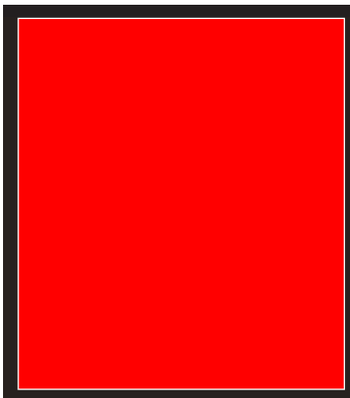
# Deliver high-quality visuals on mobile devices

Visit booth #933 to learn about solutions from ARM and our ecosystems partners

# DEVELOP DIARY

Your complete games development events calendar for the months ahead

## DIARY DATES



**The Develop Quiz**
September 3rd
Newcastle, UK
**Jess.Farnan@intentmedia.co.uk**

### AUGUST 2014

**DARE PROTOPLAY**
August 7th to 10th
Dundee, UK
***www.daretobedigital.com***

**SIGGRAPH**
August 10th to 14th
Vancouver, Canada
***www.siggraph.org***

**GDC EUROPE**
August 11th to 13th
Cologne, Germany
***www.gdceurope.com***

**GAMESCOM**
August 13th to 17th
Cologne, Germany
***www.gamescom-europe.com***

**UNITE**
August 20th to 22nd
Seattle, USA
***www.unity3d.com/unite***

### SEPTEMBER 2014

**GAMES RETAIL 2020**
September 16th
London, UK
***Kathryn.Humphrey@intentmedia.co.uk***

**REEPERBAHN FESTIVAL**
September 17th to 20th
Hamburg, Germany
***www.reeperbahnfestival.com***

**GAME MUSIC CONNECT**
September 24th
London, UK
***www.gamemusicconnect2014.com***

## NEXT MONTH'S ISSUE

**Develop #153 – September 2014**

### MUSIC SPECIAL

A follow-up to the earlier audio special, with an expanded look at music and voiceover work, and what tools and techniques studios use to record dialogue. Plus, interviews with leading composers about how video game music is changing.

### NARRATIVE DESIGN & STORYBOARDING

Leading studios discuss the different ways in which video games can tell stories, whether through dialogue trees and conversation wheels, or through music and sound.

### DISCOVERABILITY

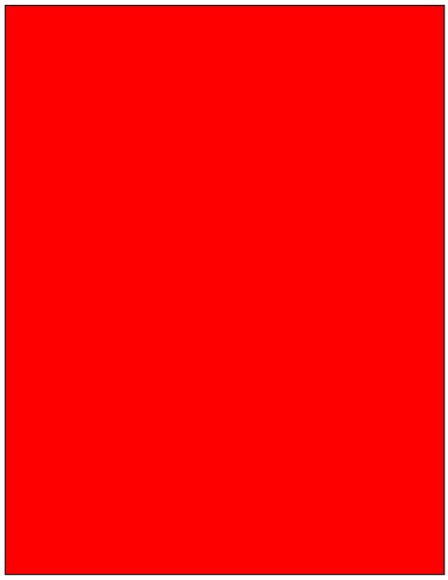
There are more ways than ever to release your game, but how do you ensure consumers will find it? We look at how the leading marketplaces organise their catalogues, and how studios can take advantage of this.

### GUIDE: WORKFLOWS AND PIPELINES

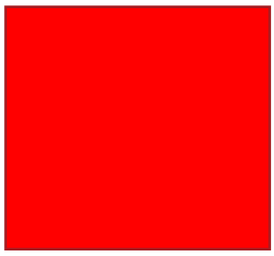
We list the software and services available that can help your studio maintain momentum when developing your next big hit.

### CLOUD GAMING

The term 'cloud gaming' instantly calls to mind streaming services such as PlayStation Now and OnLive – but there's far more to it than that. *Develop* speaks to experts to find out what cloud computing can really mean for developers, and how it can be used to both enhance and evolve some of today's most popular game genres.

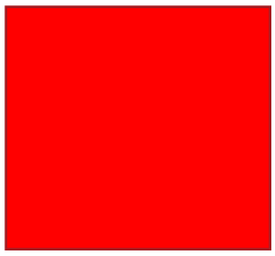


## COMING SOON



**DEVELOP #154**
OCTOBER 2014

- Monetisation: Experts' secrets revealed
- Funding & investment
- Work-for-hire
- Guide: The best mobile tools

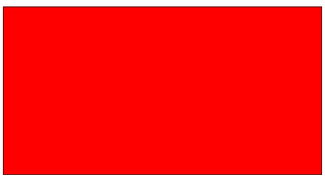


**DEVELOP #155**
NOVEMBER 2014

- Start-up special: How to open a studio
- Education and training
- Game service providers
- Region focus: Italy

**For editorial enquiries, please contact James.Batchelor@intentmedia.co.uk**
**For advertising opportunities, contact Alex.Boucher@intentmedia.co.uk**

## AT A GLANCE



**AUGUST 8TH**
**Happiness Happens Day**
So stay off the forums, Reddit, Twitter and definitely don't read the comments.

**AUGUST 10TH**
**SIGGRAPH 2014**
This year's conference on computer graphics takes place in Canada.

**AUGUST 11TH**
**GDC Europe**
The European version of GDC changes all every z to an s. Also, speakers.

**AUGUST 13TH**
**Gamescom**
Obligatory German sausage joke/ complaint about sweaty teenagers.

**AUGUST 15TH**
**The Expendables 3**
Your favourite pensioners engage in the most explosive raffle ever.

**AUGUST 25TH**
**Summer Bank Holiday**
Enjoy your day off – it's the last one you'll get this year.

# Variable declarations

//COMMENT: BUSINESS

## Smaller, faster, leaner

**Nick Gibson** mulls over the latest UK development data

*Nick Gibson says more smaller studios and start-ups are emerging, primarily focused on mobile. But while many may have winning creative ideas, few understand how to set-up a sustainable business.*

THERE WERE MORE dramatic shifts in the UK games development industry in 2013, as mapped out in our Making Games in the UK 2014 report published recently by TIGA.

No change is more emblematic than the unprecedented proliferation of micro studios (with under five permanent staff), a trend that is both welcome and potentially hazardous to the industry. This month I'll explore the implications of the UK industry becoming smaller, faster and leaner.

The number of games development studios in the UK has rocketed in the last few years, more than doubling from 278 in 2010 to 620 in 2013. During the same period, the total headcount for UK games development has only increased ten per cent (from 9,010 to 9,896). So the average number of creative staff (i.e. excluding publishing, admin and other non-development roles) employed at each UK studio has halved in just three or so years from 32 to 16 per company.

The folding and downsizing of so many larger UK studios has contributed significantly to this structural change, but of much greater importance has been the massive proliferation of new studios. Five years ago, many would have grown into more substantial outfits but these days the vast majority of these tiny studios stay tiny. The number of micro studios has nearly trebled between 2010 and 2013 from 126 to 368. Now representing nearly 60 per cent of all UK studios, this is a truly seismic structural shift.

> ***"There was a brand new UK entrant into the mobile games market every three days last year."***

The key catalyst has unsurprisingly been the adoption of mobile gaming, which has become the platform of choice for the largest group of UK studios. 49 per cent of UK studios were primarily focused on mobile games development in 2013 (up from 39 per cent in 2012). Mobile is now comfortably the most popular platform category for UK studios.

Over 120 new and existing studios moved their primary focus to mobile in 2013 alone, meaning that there was a brand new UK entrant into the mobile games market every three days or so last year. With mobile continuing to dominate among start-ups, this trend looks set to continue.

### SMALL STUDIO, BIG RISKS

Do I need to say why this is happening? The comparative ease of mobile games development and self-publishing, coupled with the allure of self-sufficiency and creative autonomy is inspiring many, assisted by the impressive financial performance of top games and high valuation exits of leading companies.

After such a long history of developing blockbuster hits for others, UK development is now making an effort to go it alone, a genuinely admirable ambition that will help it make its mark in this the fastest growing corner of the global games market. It will also help pave the way for greater investor interest much as it has done in countries like Finland. That's the theory, but what's the reality?

Unfortunately, a significant proportion of the UK's mobile games studios are undercapitalised and inadequately staffed, suitable only for short-term self-sufficiency. The overwhelming majority require third-party funding, cobbling modest amounts of equity funding from friends and family and supplementing it with grants and work-for-hire. Many have parachuted from large work-for-hire studios to focus on original IP only to find themselves reverting to work-for-hire to remain in business. This is particularly true of micro studios whose staff are usually paid either nothing or below average salaries. Many, and possibly most, of these smaller studios live on the edge, a sacrifice many will be happy to endure in the short-term but few can afford in the longer-term.

The result is that the UK's start-up boom over the last year was accompanied by the highest rate of company failures we have ever recorded. The age of the micro studio may be empowering and is already producing some highly successful new studios.

However, the high level of churn it is also causing is very destabilising for the UK industry as a growing proportion of UK developers exist on subsistence wages employed at companies with precarious financial positions and seemingly limited prospects.

The barriers to entry into mobile remain low but the barriers to commercial success are already high and still climbing. To avoid joining the recent masses of failed studios, developers need to understand that a strong creative idea isn't enough. Understanding who their game is for, how they can be reached and what motivates them to pay could make all the difference to the success or failure of a new generation of plucky British studios. ■

**Nick Gibson** is a director at Games Investor Consulting, which provides commercial check-ups, strategy and data to games, media and finance companies.
**www.gamesinvestor.com**

//COMMENT: DIGITAL

# Will gamers see a fairer digital future?

'The future is not set. There is no fate but what we make for ourselves,' quotes **Alex Ward**

IN MAY, JAMES Cameron did an "Ask Me Anything" piece on Reddit. One question was *Terminator*-related. It read, "Are there any timelines where Skynet wins. If yes, how?"

His response "One could argue that the machines have already won. All you have to do is look around at how many people are face down texting 100 per cent of the time, everywhere they are, and it's hard to imagine that the machines haven't won."

Over the past few years, the digital world has given me a simpler and happier life. But I'm still not able to lead a digital life in the way I want to when it comes to gaming.

Thanks to my Kindle and iPad Mini, I decluttered my shelves, I've bought more books and I can combine my collection with my family. Result: I read more, and buy more.

In 2007, I ripped all of my favourite movies and TV programmes to my Mac. But it's mostly redundant now – if I want to re-watch *The West Wing*, I just fire up Netflix or Amazon Instant Video, which runs on every device I own. I'm watching more movies and discovering more new shows. Result: I'm watching more, and buying more.

But digital gaming remains messy and complicated. I should be good to go 100 per cent digital, right? Wrong.

## GOING DIGITAL

First off, the prices are simply extortionate. Why would anyone pay £64.99 to download *Watch Dogs* to their PS4? That price makes no sense. Digital should be cheaper – simple as that.

Ridiculous pricing isn't happening elsewhere with other content. New films on Amazon Instant Video, Blinkbox, or Xbox Video are priced roughly the same as the physical content. Publishers spout off about "supporting a healthy retail channel" – but why not have a healthy digital channel co-exist at the same time? Do publishers and format holders enjoy a healthy mutual relationship at the expense of the consumer?

Sharing is the second flaw in the digital dream. It's not simple to move games and saves between my consoles at home and at work. Xbox One's simple Syncing makes it bearable. And I can auto-upload my PS4 saves to the cloud. *Mario Kart 8*'s steep digital price of £49.99 put the brakes on my purchase.

> ***"Amazon and iTunes transformed how we access films and music but gaming is stuck in the Dark Ages."***

So what of the near-future? Will there be streaming subscription-based services? I'd love to pre-order the *Watch Dogs* sequel now, and get early access or extra content, but I don't want to pay over the top to do so.

I'm really interested in PlayStation Now. I hope Microsoft offers something similar. I wish both of these systems offered backwards compatibility. There are a lot of great games from last year I could easily spend the next year playing. But the early reports of beta Now access shows very high price points to access very old content. I'd be partial to the odd game of *Rage Racer* or other PlayStation games via my PS4, but I'd rather pay one price to access the entire library. I've been burned too many times on Nintendo's eShop. How can an old NES game cost over a fiver?

We've had Netflix and Amazon transform how we access movies and how much we pay. iTunes and Spotify changed the way we access, find, share and love music. But gaming seems stuck in the Dark Ages. The access is complicated. The prices are insane. The sharing is limited. Both the publishers and the format holders won't act until we hit them where it hurts them the most: their spreadsheets. Gamers deserve better than this. They deserve a fairer digital world.

And just like James Cameron's prologue at the beginning of *The Terminator*, this battle will not be fought in the future. It will be fought here, in our present. Tonight. ■

*It's easy to consume all other forms of media – books, music, films and TV – 100 per cent digitally, but Alex Ward is frustrated that the same can't be said for gaming.*

**Alex Ward** is the co-founder of Three Fields Entertainment. He previously co-founded *Burnout* developer Criterion Games.
**www.threefieldsentertainment.com**

## //EXTRA CONTENT ONLINE

"After several years of iterating on point-and-click games, I burned out and wanted to do something new."

**What the Mystery Case Files creator did next**
Adrian Woods, Fezziwig
http://deve1op.net/1sQ63qK

"I'm not saying nothing will ever die in our games, but if we include death we want it to be meaningful."

**Magic Notion: The virtual drag queen's studio**
Richard Franke, Magic Notion
http://deve1op.net/1nQfEWM

"I can guarantee that if you look at your game's design document right now it will be out of date in at least one major place."

**Death of the design document**
James Sweatman, Jagex
http://deve1op.net/1mkm4gx

**To see all of our reader blogs visit: www.develop-online.net | Email craig.chapple@intentmedia.co.uk to contribute your own blog**

# VANCOUVER'S CENTRE FOR DIGITAL MEDIA

Master of Digital Media Program

**Yalda Modarres-Sadeghi**
MDM Student,
Artist

# INNOVATORS WANTED

## INDUSTRY PARTNERS

**Collaborate** on award-winning project development – R&D, prototypes, playable demos and proof of fun.

**Connect** with highly qualified talent – including programmers, artists, designers and producers.

**Access** state of the art facilities and production resources, including a sound studio and green screen capabilities.

## GRADUATE STUDENTS

- Industry-Focused Master's Program
- Competitive Scholarship Opportunities
- Startup Business Support
- Graduate from 4 Major Canadian Universities

Housed at the **Centre for Digital Media** in Vancouver, BC, the **Master of Digital Media (MDM) program** engages students in real-world projects and industry connections. Students graduate with the skills to work in the top jobs in the digital media industry as **creators, producers, designers, managers, art directors and entrepreneurs**.

"[The MDM Program] has a really nice mix because it's forefronting both the need to really understand what artistic expression is and the discipline of that, and also the need to completely embrace the new and emerging tools with which to do it."

**Ken Perlin**
**Professor of Computer Science,**
**NYU Media Research Lab**

Centre for Digital Media

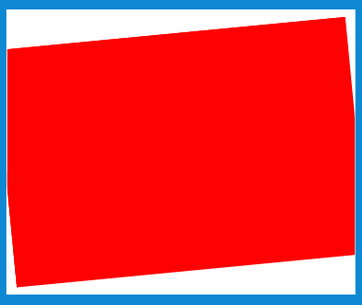
@CentreDigiMedia

**a collaboration between**

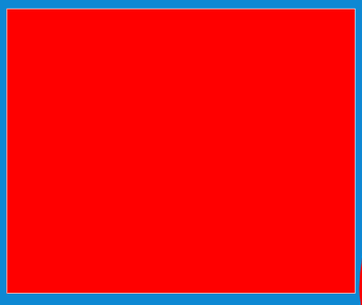
UBC SFU emily carr university of art + design BCIT

**thecdm.ca**

**DEVELOP AWARDS 2014:**
Pictures from the night and words from the winners
**P19**



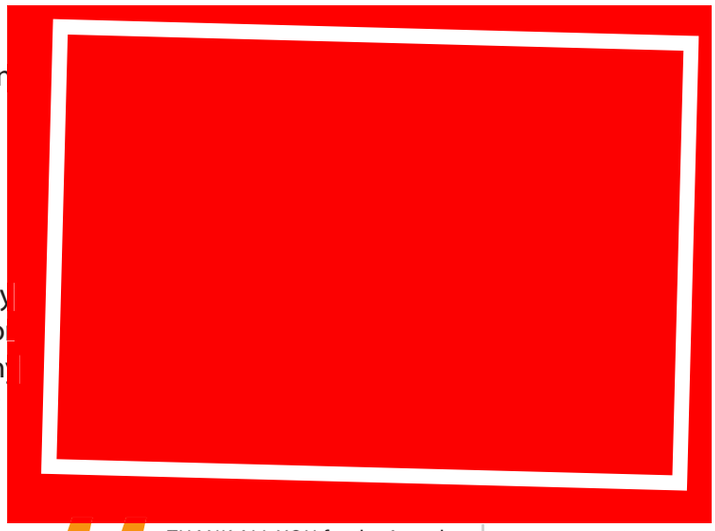
**THE LIFE OF PI:**
An in-depth look at Raspberry Pi, voted as experts' favourite tech in games
**P33**

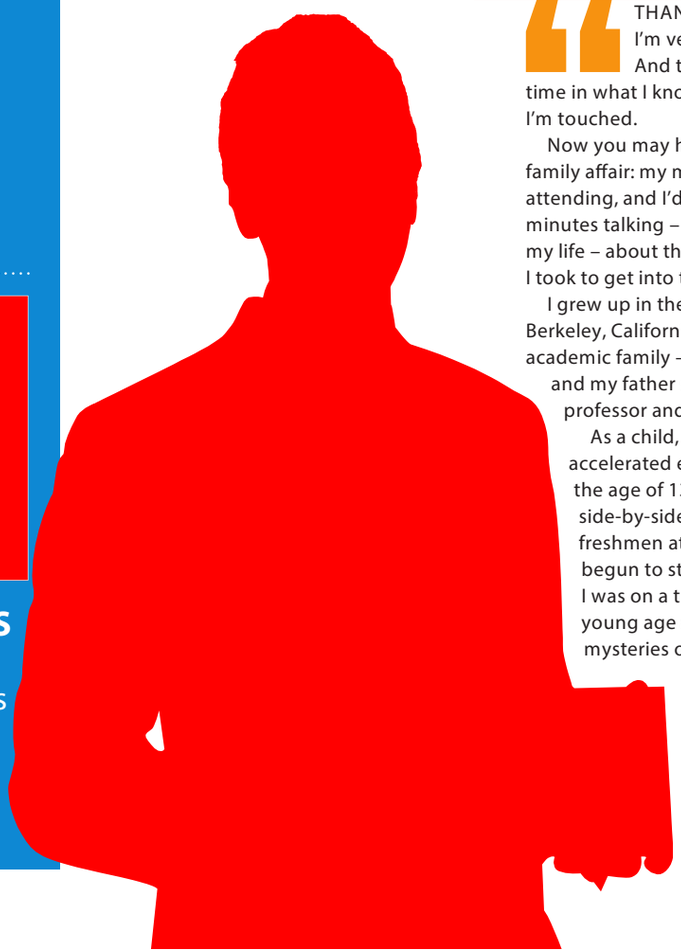


**MEDIA MOLECULE'S BIG IDEAS:**
Siobhan Reddy reveals how the Tearaway studio creates new IP
**P40**

# The words OF A LEGEND

PS4 lead architect Mark Cerny was honoured as a Developmen Legend at this year's Develop Awards, presented to him on the night by PlayStation boss Andrew House. What followed was a speech that would later be described as 'inspirational' by those in attendance. Read on fo the full transcript, in which Cern reveals the origins of his games development aspirations





"THANK ALL YOU for the Award, I'm very honoured to accept it. And thank you Andy for making time in what I know is a very busy schedule, I'm touched.

Now you may have noticed, today is a family affair: my mother and her husband are attending, and I'd like to spend just a few minutes talking – really for the first time in my life – about the personal side of the path I took to get into the games business.

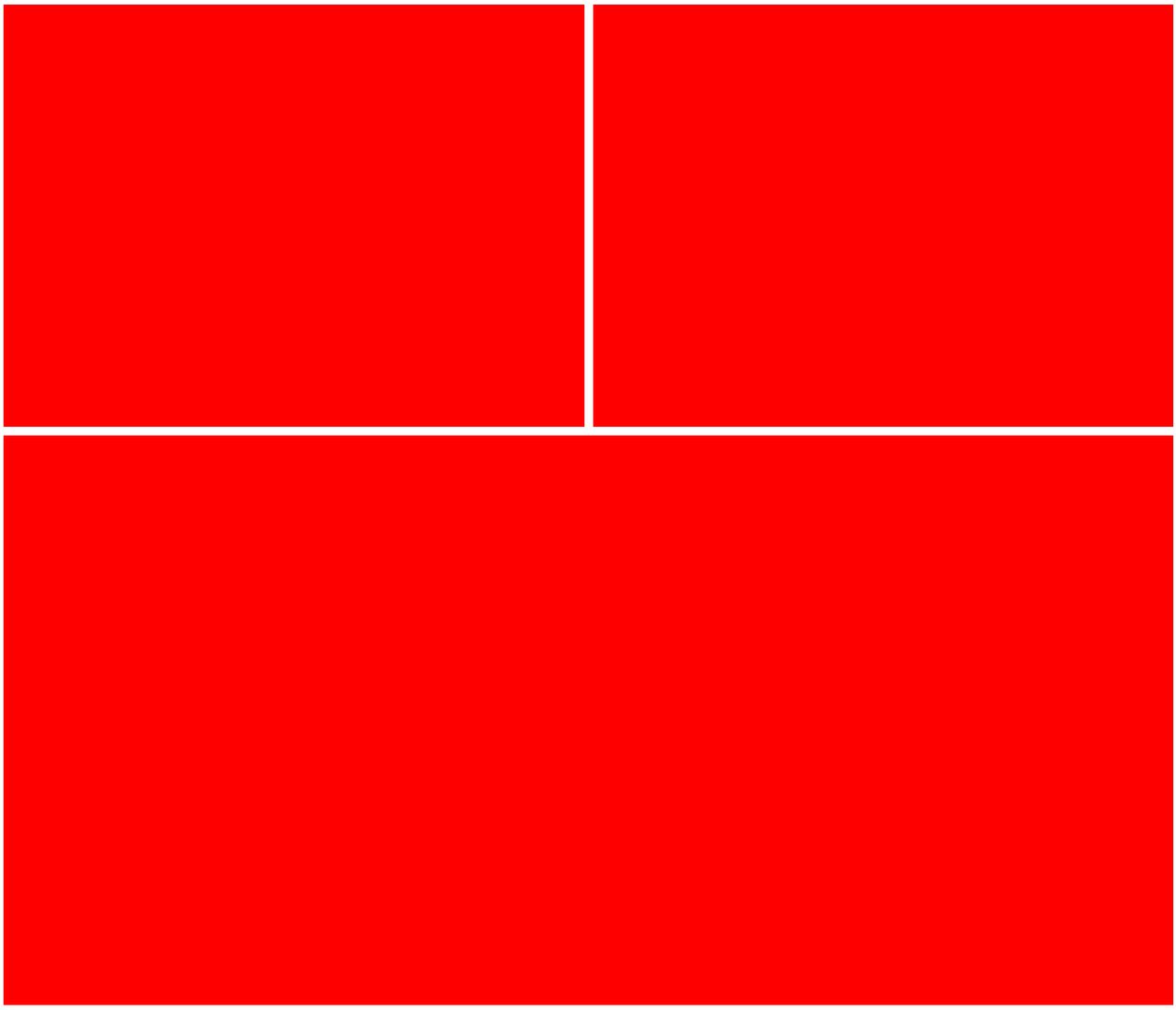
I grew up in the university town of Berkeley, California. I come from a rather academic family – my parents are both PhDs, and my father spent over 50 years as a professor and a researcher at Berkeley.

As a child, I had a fantastically accelerated education in science, at the age of 13 I was taking classes side-by-side with the 18-year-old freshmen at the University. By 17 I had begun to study graduate level physics. I was on a track to get a PhD at a very young age and go on to study the mysteries of the universe.

But in the summer I turned 17, I had an experience that changed my life. I had an opportunity to work as a research assistant on a project at the Stanford Linear Accelerator, and I

*Cerny was presented with his Development Legend award by president and Group CEO of Sony Computer Entertainment Andrew House*

*Right: Cerny's career spans decades and countless iconic franchises that he helped created, including Jak & Daxter, Crash Bandicoot, Ratchet & Clank and Skylanders forebear Spyro the Dragon*

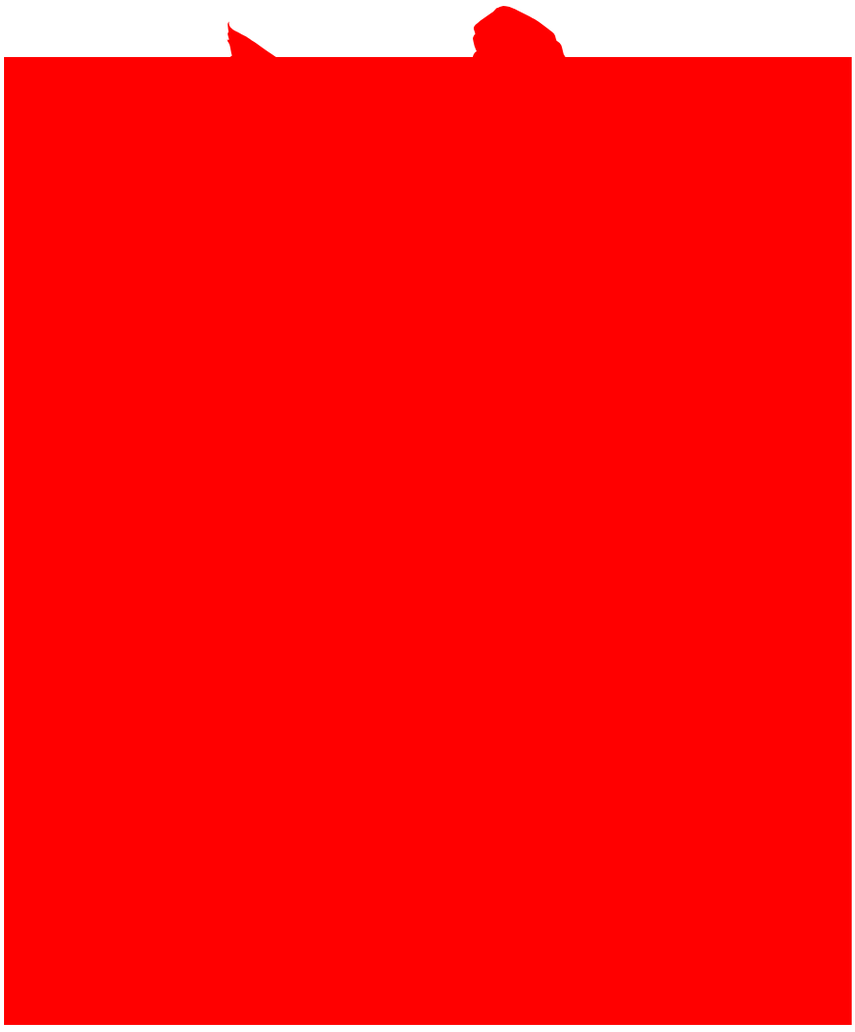


took it – I joined a team of scientists that were using this massive detector to search for short-lived elementary particles. I ended up spending my time that summer doing a statistical analysis of millions of particle tracks looking for systematic errors induced by micron-level misalignment of the detector components. And quite frankly, I hated it.

In retrospect, this was best thing I could have done – get face-to-face with my ultimate ambition, and find out that I just wasn't that interested in it. As for what I was interested in, I was spending a lot of time on hobbyist programming, and playing *Space Invaders* and the like at the local dive of an arcade – and after some soul-searching I decided to leave the university, and see if I could find a career in video games.

Now, at this time, my brother had left to go to college, and my father had just left – the family had shrunk down to just my mother and me. I'm sure my decision to leave the world of academe and hard science behind broke her heart, but she did more than simply hide her disappointment. She helped in a great number of ways as I searched for, and eventually found and took on, that first job at Atari Games. It's been over 30 years now, and you know, I've never said thank you properly. So let me do that now, with witnesses – thank you very much for that support. Without that, all of this, all I've done, could have turned out very differently indeed.

Still, though – mysteries of the universe versus video games. That's a tough one.



I have to say a wonderful thing has happened in these last 32 years – video games have not stayed in the same place. Our medium has evolved.

**GAMING GREATS**

I'm not talking about technology here, though the technological progress has been pretty astonishing – we've gone from black and white to colour to HDTV, 2D to 3D, ROMs and floppy disks giving way to 50GB games on Blu-ray.

But that's just bits and bytes – the real revolution is in the content. Peter Molyneux created the God game. Will Wright brought us the joy of the simulated world. RPGs, RTSs and MMOs flourished as genres. Games became more social.

Our medium developed to the point that the US Supreme Court ruled that video games have enough depth and meaning to qualify for freedom of speech protection as artistic endeavours.

Most recently, with games like *Brothers* and *The Last of Us*, our chosen medium has reached the point where our creations have really begun to touch the human heart, to say something fundamental about the human experience.

I believe the fulfillment that you find in your career derives from the richness of the field you're in. Looking back, my academic studies would most likely have taken me to a career in M Theory, a branch of physics so abstract that a thousand years of work has not resulted in a single experimentally verifiable prediction – it's difficult to believe that I would have been happy and fulfilled there. The truth is I chose in video games, by sheer luck, an incredibly rich and rewarding field to dedicate my life to.

It's been a pleasure and a privilege to share these last 32 years with you, and I cannot wait to find out what the next 32 years will bring for me, for all of us, and for our art form. Thank you again for the award, and thank you for your time tonight. ■

## BIO: MARK CERNY

MARK CERNY'S DEBUT game at age 18 was *Marble Madness* for Atari in 1984, the first release in a sparkling career that saw him travel the world working on major hits such as *Sonic the Hedgehog 2, Crash Bandicoot, Jak & Daxter, Spyro the Dragon, Ratchet & Clank, Killzone 3,* and *Uncharted: Drake's Fortune.*

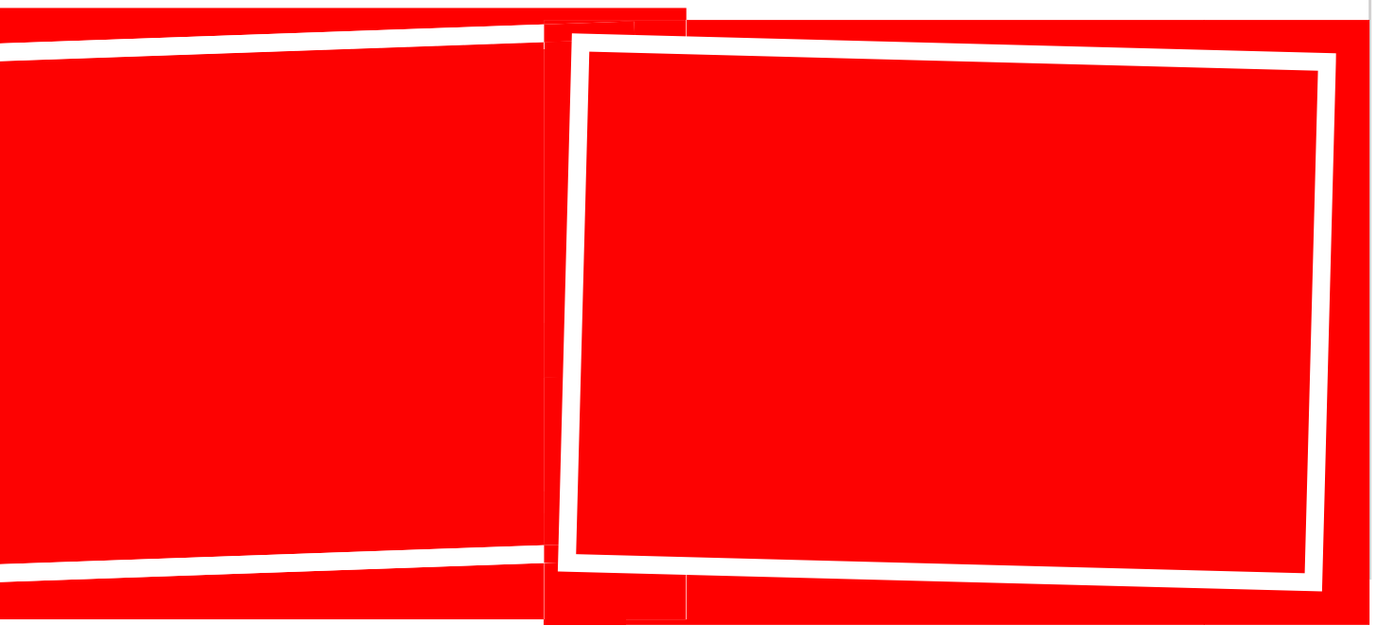
Most recently, Cerny is celebrated for being the mastermind behind the technical architecture of Sony's PS4 console. The device for which he was lead system architect has already sold over seven million units, just six months after release – a games industry record.

He joins an elite few to pick up the prestigious accolade of Development Legend. Previous recipients include the likes of Tim Sweeney, Mark Rein, David Perry, Peter Molyneux, David Braben, Charles Cecil, Phil Harrison and Ian Livingstone.

**SOME OF HIS ACCOMPLISHMENTS INCLUDE:**

- Programmer and designer on 1984 arcade game *Marble Madness*
- Programmer and designer on two 1987 Sega Master System titles: *Shooting Gallery* and *Missile Defense 3-D*
- Member of the team behind 1992's *Sonic the Hedgehog 2* as programmer and development support
- Executive producer and designer on *Disruptor* for PlayStation, released in 1996
- Helped start the *Crash Bandicoot* franchise, serving as executive producer on the original
- Launched the *Spyro the Dragon* series as executive producer and designer for the 1998 PS1 title
- Programmer on the first two *Jak & Daxter* games, and designer for sequel *Jak II*
- Designer for *Ratchet & Clank* and sequel *Going Commando*. He later served as design consultant on two more *Ratchet* games, *Up Your Arsenal* and *Tools of Destruction*
- Design consultant for best-selling PS3 games such as launch title *Resistance: Fall of Man,* Naughty Dog's *Uncharted: Drake's Fortune, God of War III* and *Killzone 3*
- Lead architect of PlayStation 4 and director of launch title *Knack*

*Below left: Cerny accepted his award and gave this very speech at the 2014 Develop Awards in Brighton in front of hundreds of industry peers*



DEEP SILVER
CRYTEK
PERFORCE
Version everything.
unity
amiqus
ukie
KEYWORDS
CODEMASTERS
CUBICMOTION
King
POWERED BY
UNREAL ENGINE
InnoGames
tandem events
US
UNIVERSALLY SPEAKING
opm recruitment

# Night of victory

The biggest names in games development descended upon Brighton for the 2014 Develop Industry Excellence Awards, all to honour the best of the best

IT WAS A record-breaking turnout at this year's Develop Awards with more than 175 companies in the room – 136 of which were in the running for this year's prizes.

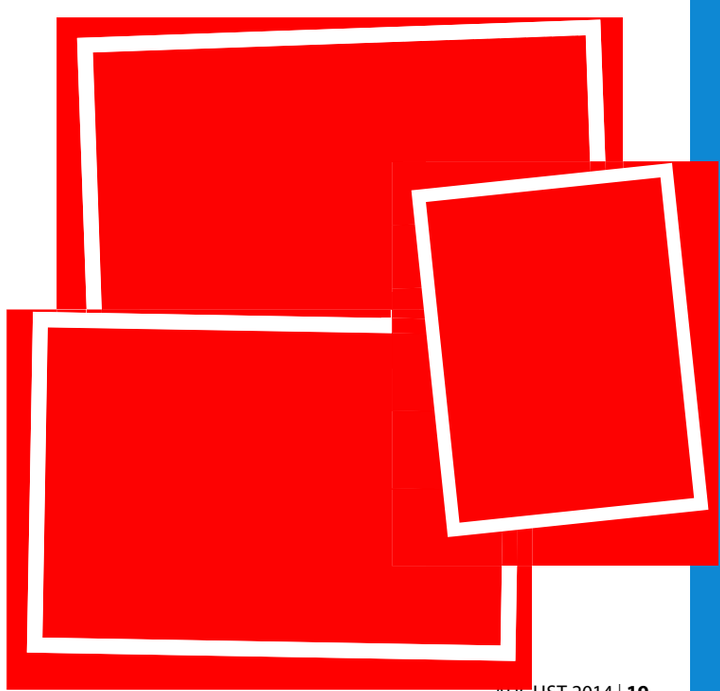
There were more chances than ever to win an expanded roster of 25 awards, including six new categories, two special prizes and a surprise award announced on the night.

**AND THE WINNERS ARE...**

Sadly, not everyone can take home a coveted Develop Award, but those who did are honoured across the next 12 pages.

Notable victories included Rockstar North, which took home four prizes including the first Studio of the Year award. Other notable winners – aside from this year's Development Legend Mark Cerny – included indie sensations such as Vlambeer and Space Ape, innovators Oculus VR, and big name studios like EA DICE, TT Games and Media Molecule.

Congratulations to the winners, and see you all next year. ■



## SERVICES TO VIDEO GAMES

**Lynne Kilpatrick, DCMS**

*"The Develop Award was a lovely surprise, made even more special by knowing that it was something voted for by industry colleagues."*

## USE OF A LICENCE OR IP

**LEGO Marvel Super Heroes – TT Games**

*"I'd like to give a massive thanks to Warner Bros for all their support over the years, and a big thanks to Marvel."*

Phill Ring, TT Games

## NEW GAMES IP

**Tearaway – Media Molecule**

*"Making new stuff requires paying a bit of soul tax and so it's really awesome when people like what we are doing."*

Siobhan Reddy, Media Molecule

## VISUAL ARTS

**Grand Theft Auto V – Rockstar North**

## AUDIO ACCOMPLISHMENT

### Battlefield 4 – EA DICE

*The audio team at DICE are once again humbled and honoured to receive this award. It was a huge team effort.*

Ben Minto, EA DICE

## USE OF NARRATIVE

### Brothers: A Tale of Two Sons – Starbreeze Studios

*It's an honor to receive this award, and being chosen from all the great games that was nominated.*

Mikael Nermark, Starbreeze Studios

*[Collected on the night by 505 Games]*

## MUSICAL COMPOSITION

### Jamie Hamshere – 'Noise Pulse' (from TxK)

*It's a real privilege to be kicking off a new category for Develop and to be representing TxK. It's an awesome title and just to be part of it is amazing.*

## PUBLISHING HERO

### SCE Strategic Content

*What a family we have here! Developers – this is for you. We love you, and you know it.*

Shahid Ahmad, SCE Strategic Content

## TECHNICAL INNOVATION

### Oculus Rift DK2 – Oculus VR

*I want to thank all of the Oculus developers out there, who are a big part of making us so successful.*

Nate Mitchell, Oculus VR

## TOOLS – PRODUCTION

### Perforce – Perforce Software

*I'm excited to see so many of our users nominated, especially for those that have won. Great work, guys.*

Mark Warren, Perforce

## TOOLS – DESIGN & CREATIVITY

### Maya LT – Autodesk

*We're extremely pleased to receive this award. New studios are the industry's future. Thanks for using our tools.*

Markus Schwaiger, Autodesk

## ENGINE

### Unity Engine – Unity Technologies

*It's an interesting year to be in the engine sector. Thanks to our fantastic users, support guys and engineers.*

Andy Brammall, Unity

## SERVICES

**Player Research**

*"Thanks to all the developers that we work with. We love you very much and thanks for trusting us with your games."*
Graham McAllister, Player Research

## CREATIVE CONTRIBUTION: AUDIO

**Stafford Bawler – Monument Valley**

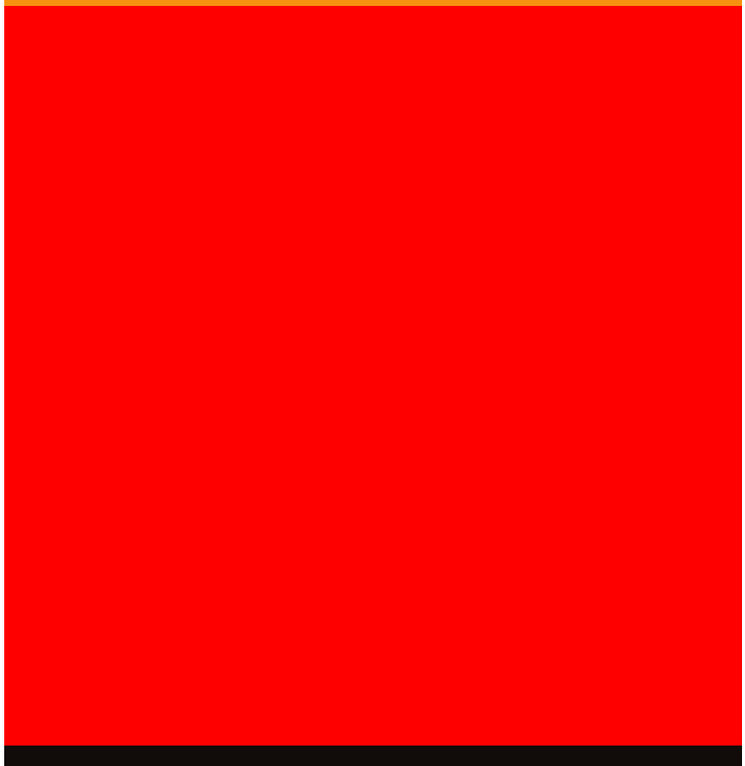
*"Thanks to Ustwo for the chance to work on such a beautiful title, to my wife, and to everyone who encouraged me to go freelance."*

## QA & LOCALISATION

**Testology**

*"A massive thanks to all our clients and staff – without them we'd be nothing. I'm very proud that we've won."*
Andy Robson, Testology

## CREATIVE CONTRIBUTION: VISUALS



**Faceware Technologies – Grand Theft Auto V**
*[Collected on the night by Rockstar North]*

## RECRUITER

### OPM Response

*Thank you to my team. There's only 14 of them, but they're all awesome. Thanks to our clients and candidates.*

Kim Parker Adcock, OPM Response

## BUSINESS DEVELOPMENT

### Team17

*Like the Worms, I'll keep this short and sweet: thank you very much.*

Mickey Torode, Team17

## TALENT INVESTMENT

### Dare To Be Digital – Abertay University

*I want to thank my colleagues, our developers and students who continue to impress and go on to bigger things.*

Ryan Locke, Abertay University

## INDEPENDENT STUDIO

### Bohemia Interactive

*Thank you Develop, and thanks to our players for supporting the games we make and the risks we take.*

Jay Crowe, Bohemia Interactive

## MICRO STUDIO

**Vlambeer**

*We see this as a token of appreciation for our work, and face the future with more dedication. We're very thankful.*

Rami Ismail, Vlambeer

## NEW STUDIO

**Space Ape Games**

*Thank you very much and let's keep trying to make the games industry a better place.*

Adam Sullivan, Space Ape Games

## IN-HOUSE STUDIO

**Rockstar North**

## STUDIO OF THE YEAR

**Rockstar North**

leaseweb
reliable hosting

# BRING YOUR GAME TO THE GAMERS

*LeaseWeb provides rapidly deployed and highly available infrastructure solutions with exceptional 24/7 customer support and a low-latency global network. From single-server setups to fully-customized hybrid environments, we provide online gaming companies with all the tools they need to reach gamers anywhere, anytime.*

"FOR OUR GAME, WAR THUNDER, WE NEED A VERY POWERFUL, LOW-LATENCY CLOUD SERVICE WITH FAST SCALABILITY AND WORLD WIDE CONNECTIVITY. ADDITIONALLY, IT'S EXTREMELY IMPORTANT TO HAVE 100% SERVER UPTIME AND A 24/7 SUPPORT SERVICE WITH RAPID RESPONSE TIMES. LEASEWEB GIVES US EXACTLY WHAT WE NEED."
**GAIJIN ENTERTAINMENT**

For more information,
please visit **leaseweb.com/en/gaming**

GDC NEXT FEATURING ADC RETURNS
**NOVEMBER 3–4, 2014**

develop

READERS, USE CODE
**GDCN14DM**
TO SAVE AN ADDITIONAL 10% ON SELECTED PASSES!

REGISTER BY SEPTEMBER 18 AND SAVE UP TO $500!

# GDC NEXT

FEATURING ADC
APP DEVELOPERS CONFERENCE

## GAME DEVELOPERS CONFERENCE® NEXT

FEATURING APP DEVELOPERS CONFERENCE

LOS ANGELES CONVENTION CENTER · LOS ANGELES, CA

NOVEMBER 3–4, 2014

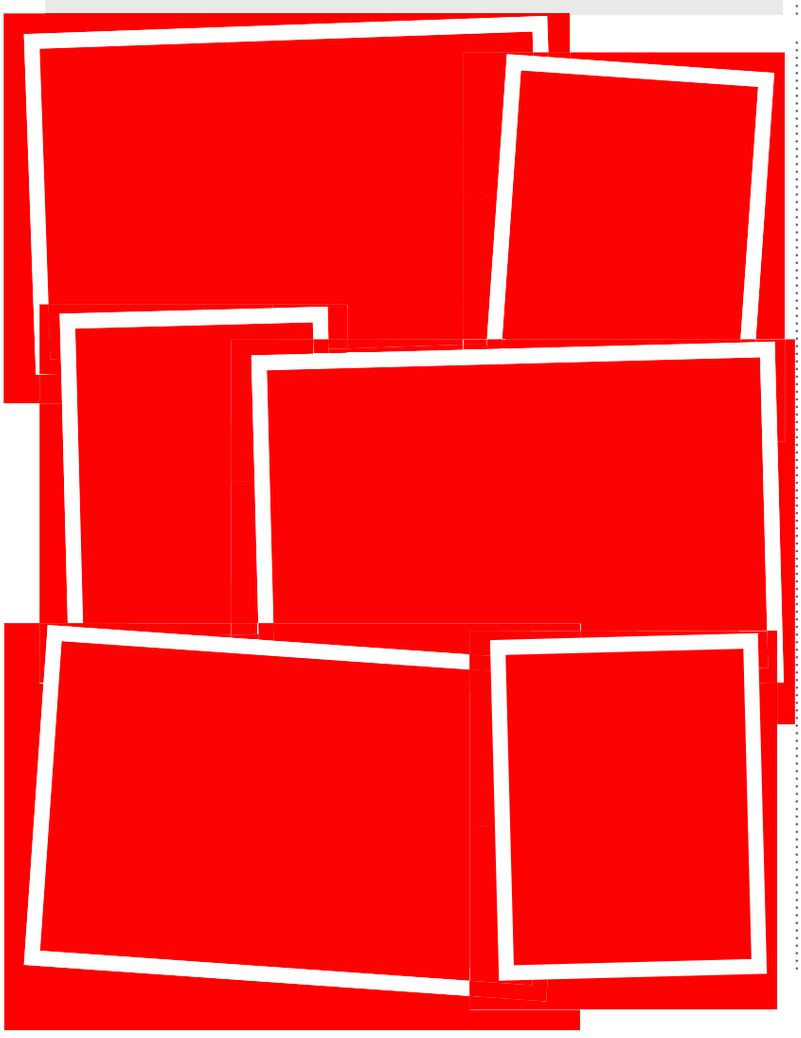
GDCNEXT.COM

UBM Tech

## DEVELOPMENT LEGEND

### Mark Cerny

***"It's been a pleasure and privilege to share the last 32 years with you, and I can't wait to find out what the next 32 will bring for all of us and our art form."***



## THE JUDGING PANEL

**CLOSE TO 100 games industry experts voted on this year's nominees, and Develop is very grateful for their support:**

AJ Grand-Scrutton *(Dlala Studios)*
Alastair Aitcheson *(independent)*
Alex Wiltshire *(Hello Games)*
Alexandru Voica *(Imagination Technologies)*
Aaron Lee *(Develop)*
Alice Taylor *(MakieLab)*
Andrew Bowell *(Havok)*
Andrew Oliver *(Radiant Worlds)*
Andrew Smith *(Spilt Milk Studios)*
Andrew Webber *(Microsoft)*
Andy Brammall *(Unity)*
Andy Emery *(Side)*
Anthony Douglas *(Unity)*
Ben Parfitt *(MCV)*
Ben Wibberley *(VMC)*
Bruce Grove *(OnLive)*
Carri Cunliffe *(Secret Sauce)*
Chantel Benson *(Mixamo)*
Charlie Czerkawski *(Guerilla Tea)*
Chris Dring *(MCV)*
Chris Kingsley *(Rebellion)*
Chris Wilson *(Abertay University)*
Christopher Clarke *(Plan of Attack)*
Dan Marshall *(Size Five Games)*
Dana Cowley *(Epic Games)*
Dave Cullinane *(Realtime UK)*
Dave Ranyard *(SCE London Studio)*
David Banner *(Wales Interactive)*
Debbie Bestwick *(Team 17)*
Dennis Heinert *(Innogames)*
Ella Romanos *(Strike Gamelabs)*
Emma Smith *(Creative Assembly)*
Frank Delise *(Autodesk)*
Gareth Edwards *(Cubic Motion)*
Gary Dunn *(Codemasters)*
Georg Backer *(Hot Sauce)*
Giselle Stewart *(Ubisoft Reflections)*
Graham McAllister *(Player Research)*
Guillaume De Fondaumiere *(Quantic Dream)*
Imre Jele *(Bossa Studios)*
James Batchelor *(Develop)*
James Brooksby *(Born Ready Games)*
Jamie Sefton *(Game Republic)*
Jason Kingsley *(Rebellion)*
Jeff Minter *(Llamasoft)*
Jessica Curry *(TheChineseRoom)*
Jo Twist *(UKIE)*
John Broomhall *(independent)*
Jonathan Smith *(TT Games)*
Jude Ower *(Playmob)*
Julien Hoffer *(Datascope)*
Karl Hilton *(Crytek UK)*
Liz Prince *(Amiqus)*
Luke Dicken *(IGDA)*
Mark Estdale *(OMUK)*
Michael French *(Intent Media)*
Michael Souto *(LocalizeDirect)*
Mick Morris *(Audiomotion)*
Mike Bithell *(independent)*
Mike Burnham *(Marmalade)*
Miles Jacobson *(Sports Interactive)*
Molly Carroll *(Chucklefish)*
Natalie Griffiths *(Press Space)*
Nick Baynes *(Iron Fist Games)*
Nick Button-Brown *(Impossible)*
Nicoll Hunt *(I Fight Bears)*
Nizar Romdhane *(ARM)*
Oscar Clark *(Applifier)*
Oskar Burman *(Rovio)*
Patrick O'Luanaigh *(nDreams)*
Peter Lovell *(Jagex)*
Phil Wilson *(eeGeo)*
Rob Clarke *(Curve Digital)*
Rob O'Farrell *(Dovetail Games)*
Robert Troughton *(Pitbull Studio)*
Ron Ashitani *(Atomhawk Design)*
Shahid Ahmad *(SCEE)*
Simon Barratt *(Four Door Lemon)*
Simon Doyle *(Team Junkfish)*
Simon Hade *(Space Ape Games)*
Simon Miles *(Codemasters)*
Simon Roth *(Machine Studios)*
Sophia George *(V&A Museum)*
Stuart Poole *(YoYo Games)*
Stuart Rice *(Testronic)*
Tony Beckwirth *(Studio Gobo)*
Tony Liviabella *(SN Systems)*
Torsten Reil *(NatualMotion)*
Tulin Green *(Perforce)*
Vickie Peggs *(Universally Speaking)*
Will Freeman *(Develop)*

We're hiring talent at all levels and across disciplines to make brilliant racing games with us. Codemasters offers you the chance to work on high profile titles, flexitime to ensure you maintain an excellent work/life balance and working environments to suit your lifestyle at our countryside Warwickshire campus or our city-centre studio in Birmingham.

We've been making great games at our Warwickshire campus for over 25 years. Today, our HQ has evolved into a cutting edge-facility which plays home to the BAFTA Award-winning Racing Studio, the talent behind the DiRT and GRID franchises and our online community hub RaceNet. Our countryside Warwickshire campus also hosts our innovative Digital Studio and ground-breaking Central Technology team.

For over five years, Codemasters Birmingham has been home to the BAFTA Award-winning series of FORMULA ONE games and now hosts the talents of two teams: one crafting new FORMULA ONE experiences for consoles and the other creating mobile games. Whichever team you choose, you'll find colleagues who pride themselves on doing great things in a supportive and innovative environment. Codemasters Birmingham offers a friendly working culture in an open-plan, fully refurbished 6th floor office overlooking the city's entertainment district.

## GET IN TOUCH
recruitment@codemasters.com

## FULL DETAILS
codemasters.com/jobs

## FIND OUT MORE ABOUT CODEMASTERS
codemasters.com/blog

twitter.com/codemastersjobs
facebook.com/codemastersjobs

CODEMASTERS®

# The life of Pi

**Craig Chapple** speaks to Raspberry Pi CEO Eben Upton on the story behind the tiny computer, how it can make an impact on education and why the UK is unprepared for the impending computer science curriculum

THE TINY CREDIT-CARD sized Raspberry Pi computer was launched two years ago in February 2012 to immediate success.

Designed to encourage children and the wider public to get into programming at an accessible price, the Pi immediately sold 100,000 units on its first day. The figure beat the non-profit foundation's wildest dreams. It had hoped at best to reach 10,000 sales. In fact, the organisation's realistic target had been to sell 1,000.

And now, the tiny computer has been voted by industry professionals as the top tech in games in the Develop 100 Tech List, and has sold more than three million units, surpassing popular programmable computers of old such as the BBC Micro and Amstrad CPC.

Indeed, it was those classic machines from the 80s, and the lack of successors to those systems in the late 90s and 00s, that inspired its creation, says Raspberry Pi CEO Eben Upton. That and the subsequent lack of coding talent following the death of these machines.

## RISE OF PI

"I was involved in interviewing people to come and study at Cambridge from 2004 to 2007," says Upton.

"And the really shocking thing was the number of people applying to study computer science at Cambridge was much lower than it had been a decade before."

When Upton himself attended Cambridge University, the course had been tough to get on to, such was the high demand. The class, he says, was full of people who had got to grips with coding from an early age thanks to systems like the BBC Micro, with Media Molecule co-founder Alex Evans also studying there.

"There was a real sense by ten years after that, by the time I was interviewing people, that the home computing culture had gone away and, as a result of the disappearance of that, we were getting fewer people coming in to university," states Upton.

"The people coming in were still very bright, but they hadn't had that level of practical experience. And that then limited what they could do when they went on to graduate.

> ***"The number of people applying to study computer science is much lower than a decade ago."***
>
> Eben Upton, Raspberry Pi

"A number of people at Cambridge had this realisation – and the Raspberry Pi was just our attempt to reboot that computer that goes in your bedroom."

## EDUCATING THE NEXT GENERATION

One of the key ideas behind the Raspberry Pi, as well as creating something programmable that helps people learn to code, was to ensure it was available at an accessible price.

The new Raspberry Pi B+, which includes new features to the hardware such as four USB 2.0 ports, better audio and low power consumption, still costs around £25.

Upton insists though many assume most people in the country already have computers, that is not the case, and he believes the Pi is a viable and crucial alternative for those without the funds for a beefier PC.

"A lot of people still come up to us and say, 'why are you doing this? Everybody's got a computer. Why don't you just write a software platform that runs on the computers everyone has?' And it's just not true," he says. "There are people that just don't have computers."

The Pi could help solve this issue though, and with three million already sold, it's well on its way to playing a role in teaching crucial computing skills to children, ready for a new age reliant on technology.

But it's not just the Pi, the UK is gearing up for the introduction of a rigorous new computer science curriculum to help bring the UK back to the forefront of the computing industry, and plug the digital skills gap as noted in the Livingstone-Hope report after

*Raspberry Pi CEO Eben Upton (above) hopes the tiny computer (below) can revive the home computing culture prevalent in the 80s*

*The Picademy (above) is a free two-day course in Cambridge that offers a chance for teachers to get to grips with coding on the Raspberry Pi*

years of neglect and teaching children to work with software, rather than create it.

"It's incredibly important [to have computer science on the curriculum]," says Upton.

"When we first started doing this we felt like a voice in the wilderness. We were the only people talking about this. And that was around 2006.

"The wonderful thing over the last few years is that there's even been this massive upsurge in organisations like Computing at School, which is supported by the British Computing Society. You've also got all these after school clubs and schemes like Coder Dojo and CodeClub."

## TEACHING TEACHERS

Despite his optimism about computer science finally entering the UK curriculum as the fourth science, Upton says he's concerned about whether the country and its teaching workforce is ready for the change.

"It's an enormously challenging transition," he says. "I think the scale of the funding required to do this teacher training properly is a hundred million pounds, or high tens of millions."

Though the government has its own scheme to teach a select number of teachers, who will then go on to educate their colleagues, the Raspberry Pi Foundation is also playing its own part in preparing them for the coming changes via the Picademy.

The free, two-day course works by bringing in 25 primary and secondary school teachers to the Raspberry Pi offices in Cambridge, showing them how to use the Pi in the classroom and assist with teaching the new curriculum. Though currently taking place at its offices, the organisation aims widen the net and begin hosting sessions off-site by the end of the year.

And the early signs are that the Picademy is working, and the Pi is slowly making its way into real classrooms across the country.

"At the moment we're trying to work out what the best way is to integrate it with the existing computing facilities that schools have, because schools already have computers," admits Upton.

"There's an argument that what you should do is install educational software like Scratch on the computers at school. Scratch also runs well on the Pi, and the child can have the Pi at home, so they can use it as a way of getting an extension of the experience they're having at school at home."

> ***"The scale of funding required to do this teacher training properly is £100m, or high tens of millions."***
>
> Eben Upton, Raspberry Pi

Industry veteran and UK creative industries champion Ian Livingstone, who co-wrote the Livingstone-Hope report, is a keen supporter of computer science on the curriculum and of the Raspberry Pi. He has claimed on a number of occasions that for £15m, the government could buy every child in the country a Pi. Despite the costs of such a venture, he believes the net outcome would be "way beyond the cost of a Raspberry Pi".

"Computer science is the new Latin," said Livingstone at last month's Develop Conference in Brighton.

"No matter where you come from, or how disadvantaged, any child could learn to code and become the next Mark Zuckerberg. It is the great equaliser and a great opportunity."

## PIS FOR ALL

Upton says though the Pi isn't the only way for children to learn to code, he does see value in ubiquity, and thinks such a scheme could work if government was willing to make the investment.

"A really good example of this is France back in the 1980s," he explains. "They had this thing called Minitel, which they replaced their telephone books with, and they gave it to everyone. Because everyone had it, you could assume everyone had it, and this whole ecosystem grew up around it.

"So I think there is value to it, and I think in general what there's value to though is just making sure that everyone has a programmable computer, and the Pi isn't the only way of doing this. You can do this with recycled PCs, you can do it with maybe other little computers and cheap laptops.

"We live in this age of appliance computing. A world in which the majority of computing devices are closed platforms, such as games consoles and set-top boxes. There's value I think in making sure that every household owns at least one computer which is not an appliance, and we are surprisingly far away from that world at the moment."

Having already made an early impact on the UK programming and education scenes, the Raspberry Pi surpassing the original goals set for it with each passing day.

And with further software enhancements on the way, the Picademy scheme and the introduction of computer science to the primary and secondary school curriculum, perhaps the Pi could play a central role in the future of education in the country. ■

VMC™

# THE MOST IMPORTANT WORK

# YOU'LL NEVER SEE

vmc.com/games

No one is more serious about delivering a great game experience than VMC

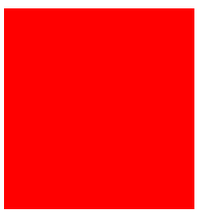
- **Quality Assurance and Testing**
- **Live Game Operations**
  - Player Support
  - Game Mastering and In-Game Support
  - Community Management and Moderation
  - eSports Management
- **Global Beta Test Network**
- **Localisation**
  - Translation
  - Audio
  - QA
- **Game Porting and Re-engineering**
- **Test Automation**

**Slough** UK | **Montreal** Canada | **Redmond** USA

vmc.com/games

# The art of making reality virtual

The popularity of simulation games has grown dramatically during the past few years, but how can developers adapt to this opportunity? **James Batchelor** talks to Dovetail Games' Rob O'Farrell to find out



*Despite a number of whacky simulation games, such as Surgeon Simulator (far right) poking fun at the genre, Rob O'Farrell (above) believes this only helps to broaden the market for more serious entries, such as Train Simualtor (main)*

YOU NAME IT, someone's probably made a Simulator out of it – and we're not just talking about the usual trinity of planes, trains and automobiles.

Simulation games are abundant in today's market, covering a multitude of occupations and transportation including (but not even remotely limited to) farming, fishing, surgery, truck driving and shipping, air traffic control, , the emergency services and, yes, goats.

Such titles used to be dedicated solely to flight and found only on PC, but now they have spread to all platforms. So what has driven this rising popularity?

"Simulators fulfill hobbyists' dreams," Dovetail Games' vice president and executive producer Rob O'Farrell explains. "They give people the ability to live out something that they're passionate about but might not be able to do in everyday life. Whether it's becoming a train driver, learning to fly a plane, or powering a huge truck, what makes this genre great is that it puts people in control of a real-life situation."

## SENSIBLE SIMULATION

Well, that makes sense for the majority of titles out there, but the notable exceptions of *Surgeon Simulator*, *Goat Simulator* and the recently announced *Rock Simulator* (no, really) have garnered cult followings of their own.

"Something different or unexpected will always grab the headlines," says O'Farrell. "Every successful genre in any medium enjoys satirical versions of existing best-sellers. But that's not necessarily a bad thing, as it helps keep things fresh. And if it also helps to draw more attention to the diverse range of products within the genre – then that's great for everyone."

> ***"Simulators fulfill hobbyists' dreams. They give people the ability to live out their passions."***
>
> Rob O'Farrell, Dovetail Games

*Goat* and *Rock Simulator* in particular are responses to how diverse the – for want of a better word – 'serious' simulation market has become but in satirising the genre, do they not also openly mock it, and by extension the dedicated and enthusiastic fans that pour hundreds of hours into their favourite titles?

"I daresay there are some purists out there that wouldn't give these types of simulations the time of day, and perhaps there are some people that feel they poke fun at the genre," agrees O'Farrell. "In my opinion, it's all about variety and choice. As long as people can find the kind of product they want to enjoy, be it serious or light-hearted, then I can't see why anyone needs to feel aggravated."

## ATTENTION TO DETAIL

However, while these kind of simulators have come seemingly out of nowhere, simulation is not a genre that can be entered into lightly. It presents a unique set of development challenges, perhaps more than any other genre, as not only does the final experience have to be enjoyable and accessible, it also has to be as realistic as possible.

While the handling of *Destiny*'s speeders can be explained away as true to a fictional craft, the slightest discrepancy in a simulator's mechanics can provoke the wrath of many hardcore enthusiasts.

Fortunately, advances in engine and middleware technology don't just enable devs to create fancier fantasy worlds; they also give Dovetail and similar studios the tools to refine their simulations to bring them even closer to reality.

"Working with the very latest and most cutting edge technology is a big part of our focus," explains O'Farrell. "It allows us to achieve unparalleled audiovisual fidelity and physical simulation.

"In *Dovetail Games Fishing*, for example, Unreal Engine 4 has been fantastic for helping us to get the casting mechanism just right, and this is very much a fundamental part of the game."

And now Dovetail has the chance to revitalise the title that arguably started it all: *Microsoft Flight Simulator*. Under a new deal with Microsoft, the UK firm will now have access to the technology that powered this pioneering series, enabling them to not only redistribute the last release, *Microsoft Flight Simulator X*, but also to develop brand new games based on the same tech.

"Starting to create any game from scratch brings so many challenges for developers," he says. "Our new licensing deal with Microsoft has enabled us to bypass some of these challenges. Not only has it allowed us to get straight into the flight sim business, it's provided us with some superb technology to build from, and importantly, it's given us the opportunity to connect with an established, enthusiastic and thriving community."

Given the size and scope of the simulation market now, it's safe to say there's no danger of it diminishing. The 'serious' simulators may remain the closely-guarded domain of dedicated enthusiasts, but the wackier, more humourous entries can help broaden the genre. Whether the next hit is a flight, farming or focaccia bread simulator, O'Farrell believes there will always be an audience waiting to try something new in the ever-growing simulation market. ■

## SIX STEPS TO A SUCCESSFUL SIMULATION GAME

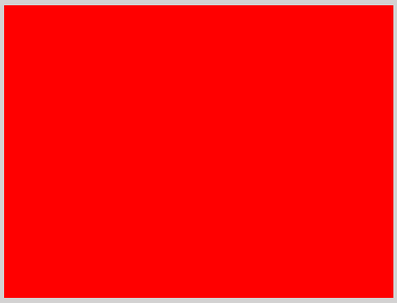
**USING THE *TRAIN SIMULATOR* series as a case study, Dovetail's Rob O'Farrell details the many challenges devs must overcome when creating simulators:**
Unlike a lot of other gaming genres, simulation encourages a direct and rigorous comparison to real life events and machinery, and if you get that wrong you risk ruining the illusion for the whole game and turning off large chunks of your audience. We walk a tight rope to strike the right balance between realism, entertainment and accessibility.

**1. Research is key to delivering a great experience**
Building relationships and trust with the train operating companies doesn't happen overnight and it can take months or even years to establish a solid working relationship. Getting access to the right trains to collect images and sounds for our research is crucial – even if some models have been scrapped, like some of the old steam locomotives, or are just really hard to get physical access to.

**2. Take care with asset creation**
Our fans demand that our trains are very realistic in how they look and drive, while the train companies want to be presented in the best possible light. Train operators like their stock to look clean, while our players like locomotives to have a realistic, grubby feel.

Both know every inch of the trains we create so we need to become experts in every train we model. This is a very time-consuming part of our development and can make planning a tough task.

**3. Balance your performance data**
Accuracy is king but there are times when we are unable to release certain sensitive information from the train companies' point of view, so this requires a delicate balancing act to avoid alienating either our rail partners or our fans.



**4. Research international differences**
While signalling systems are all trying to fundamentally achieve the same goal – the safe transit of trains around the rail network – there are a great many different systems. Different countries combine various signalling styles and components in different ways to meet their needs, whether high speed, high-density commuter or long distance heavy freight.

**5. Prepare for scale**
On top of the signalling we have to lay hundreds of miles of track, which in turn leads to countless different ways the tracks can be driven. This is a huge technical challenge that needs to be overcome.

**6. Make time for testing**
The Donner Pass route in California is around 160 miles, end-to-end. The line speed is about 40mph for a heavy freight. That scenario takes over four hours to play and needs to be played over and over to get the feel right. Iteration and bug fixing can be time-consuming, especially if a bug is found. With the move to Unreal Engine 4 in *Train Simulator*, automated testing is something that is going to become a crucial part of our development and QA.

# Media Molecule's big ideas

Boasting two hit new IPs since its formation, **Craig Chapple** speaks to the developer's studio director Siobhan Reddy about the creative process behind LittleBigPlanet and Tearaway

*Siobhan Reddy (main) describes the development of new IP such as Tearaway (right) as a 'rambling process'*

MEDIA MOLECULE IS undoubtedly one of Sony's most talented first-party studios, a creative hotbed that has sparked some its most critically acclaimed games in *LittleBigPlanet* for PS3 and *Tearaway* for Vita.

Both titles feature a vibrant colour palette, offer a playful nature and present unique experiences tuned to their respective hardware. Its games are also proof that not all console releases need to be shooters to be system sellers, a mantra much like Nintendo's.

The studio, which just won the Develop Award for New IP for its work on *Tearaway,* is never content to sit on success either. After twice tackling *LittleBigPlanet*, it has handed the IP over to Sony XDev and other talented studios, with *LBP3* currently being developed by UK outfit Sumo Digital, the studio behind the *Sonic & All Stars Racing* series. It subsequently moved on to *Tearaway* for Vita and is currently at work on a new IP for PS4.

## LITTLEBIGIDEAS

Speaking with *Develop*, Media Molecule studio director Siobhan Reddy describes developing a new IP as a "rambling process", where ideas are brought together like they are in a game jam, using a clear starting point to revolve around.

She adds this is a completely different creative process to that of a sequel, and for obvious reasons, takes longer. For example, if Media Molecule was to make *Tearaway 2* now, she says, the challenges involved would be markedly different from the first entry.

"In the first one we had to figure out things like, what is the world constructed out of?" says Reddy. "We always had the idea of paper, but getting to the purity of the paper we had, everything being constructed and how it moved did take us a little bit of time."

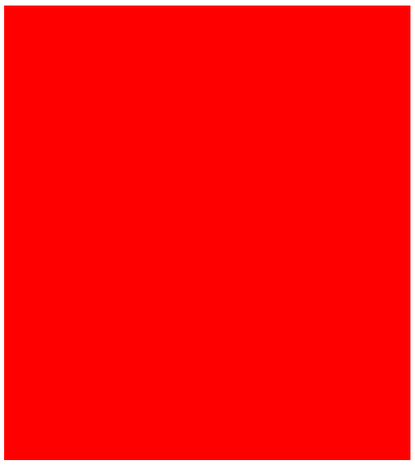
> ***"You have to keep check on yourselves that you're not going off on one. But sometimes that's required."***
>
> Siobhan Reddy, Media Molecule

"So yes, we have the construct of the world, the fantasy of the world. But when you are beginning from scratch, there isn't a set process that you can go through. You have to keep check on yourselves that you're not basically just going off on one. But sometimes going off on one is what's required.

"So that's why it's really important to work with people that you trust and that you have that kind of creative relationship with, which means you can jump off together and know that you'll find the wings."

It's a creative process that was used for both *Tearaway* and *LittleBigPlanet* before it. Reddy says the concept for the original *LBP* was the meeting point of a set of ideas each of the co-founders Mark Healey, Alex Evans, David Smith and Kareem Ettouney had for the title. And after working together to merge those ideas, the team was eventually able to craft a seamless experience together.

"David worked on a physics engine and had a gameplay prototype that was a physical platformer, which really ends up being like the play side of what *LittleBigPlanet* was," explains Reddy.



*The world of Tearaway (left) was gradually grown out of Rex Crowle's innovative ideas for making use of the Vita's back touch controls*

"The idea of really wanting to make a tool that people could make games using was really important to everybody. But it was particularly important to Mark, who grew up as a Commodore 64 child. It was his entry point into the games industry, and he'd seen that as something that he would really like to be able to build. And that had inspired Alex and Kareem as well."

Reddy goes on to describe the process of merging together ideas as like writing a piece of music, with developers bringing their creative thoughts to an informall meeting to talk through how the ideas might work. If they resonate with others, then they become part of a real thing, and can form the basis of the next game.

"It's an ethereal thing. There is no exact science to it other than starting with some ideas and then trying to find the best way to manifest those so that we can see them, and then we can feel them and then we can play them. It's not a linear thing, you don't have the idea and then you see it and it's great.

"It's more often you have the idea, you see it, you bring a bunch of ideas together, and then you look at it and you're like, oh okay, that's what that looks like, so what we need to do now is tweak this."

## UNTETHERING CREATIVITY

Though the core concept of *LittleBigPlanet* stayed the same – enabling players to create their own worlds – some of the applications and designs changed before the game was finished.

Examples include how players could create or interact with objects. Originally users had physical tools, such as physical paint brushes and a decoration stick to hang decorations on a wall.

"We loved that, it had a real playfulness to it and it was really great," says Reddy, before admitting: "What we realised when we implemented it was it wasn't flowing enough. To build a complex level would have been really difficult.

"So that's kind of one of those examples where we implemented the idea and then were like, okay, that's cool, but we'll move over here."

The ideas for *Tearaway* meanwhile began with the studio itching to work on a handheld device, with lead creator Rex Crowle expressing early on the idea of using the back touch of the Vita to effectively 'poke' a player's fingers through.

Despite the simple idea however, it wasn't clear early on what kind of game this could be used in, or how central such a mechanic would be for a game.

"It probably took us a while to get to the point where we had the game that made the best use of that idea," says Reddy. "That was the thing we all really wanted to see. When he said it we were all like, that's so cool.

"And then we tried out a whole bunch of different ideas of ways of interacting with the Vita, and then finally settled upon *Tearaway*."

She adds: "But it took us a while, how do we best make that experience? Are you always using the back touch? Are you only using it sometimes? Are you using other things? Is there a character in there? And by the end we realised, yes, we needed another character in there, you couldn't be using the back touch all the time, it was brilliant to use all the features, and we can introduce that idea of you as the character."

> ***"I don't think the exploration is that strange. That's what anybody with new IP goes through."***
>
> Siobhan Reddy, Media Molecule

Given the seemingly complex nature of the creative process, and the changes on the way, when asked if ideas start off completely differently to the end result, Reddy says that isn't the case at all.

She explains that you can see the relationship between the start and end points of each project it has made, and the studio has never had anything turn out completely different to the core idea.

"It's often, when you just say a word, or you're just saying that you want to make a Commodore 64 for this generation, it's so easy to say, but to figure out what the logistics of actually making that are means that you end up often having to explore a whole bunch of different things," she states.

"I don't think the exploration is that strange. That's probably what anybody coming up with new IP goes through to a certain extent."

Despite having a hugely creative senior team, that includes *Tearaway* creative lead Rex Crowle, Reddy says everyone at the studio, even junior staff, are allowed to join in on the creative journey for new IP and contribute their own ideas to the pot.

Moving forward to new games, Reddy remains tight-lipped on whether the studio will be returning to *Tearaway*, but teases: "We love *Tearaway*".

For now though, Media Molecule is embarking on another new IP for the PS4, for which it gave a brief glimpse of during the console's announcement last year, and will undoubtedly be applying that "rambling" creative process that has proven so successful in the past. ■

# Congrats to all the award winners!

Unity took home Best Engine 2014 and we can't thank you enough for making it possible.

Proud sponsor of Develop Awards 2014 | unity

# Opening **Windows**

A new partnership between Microsoft and Marmalade Technologies is making it easier for developers to bring games to Windows platforms, a marketplace considerably less crowded than its rivals. **James Batchelor** finds out more

TO SAY THE app stores of the world are a little crowded is something of an understatement. The costs of running a studio and creating a game have dictated that many developers can only afford to make mobile games, and yet the chances of success are slim thanks to the oversaturation of Apple and Google's marketplaces.

However, Marmalade Technologies – creators of the cross-platform development kit of the same name – is quick to point out an arguably overlooked alternative.

"Microsoft has been invigorated by its new CEO," explains Marmalade COO Donald Beatson. "It has become a serious mobile company by acquiring Nokia, and its latest Windows 8.1 platforms are very competitive.

"We've just finished upgrading our feature set for developers wanting to publish to the Windows Store, and with our recently announced Marmalade Free, all Marmalade developers can now publish to both the Windows Phone Store and Windows Store."

The middleware firm has also struck a deal with Microsoft to publish ten games made with Marmalade, and plans to use that as a springboard to encourage more of its clients to publish for Windows using the Marmalade SDK.

It's a good fit for Microsoft, which is going to great lengths to reach more studios, indies and students to grow its platforms.

> ***"Microsoft wants developers to expand their skills by innovating games on out platforms."***
>
> Andrew Webber, Microsoft

As these make up the majority of Marmalade's customer base, Microsoft UK's indie game dev marketing lead Andrew Webber is confident that more apps will be ported to Windows.

"Microsoft wants developers to expand their skills by innovating and differentiating games on our platforms," he says. "Through initiatives such as Greenshoots, Ventures and BizSpark, we aim to help businesses grow and prosper. Their success is our success.

"We are currently in talks to host Marmalade porting labs. Marmalade has been extremely supportive in offering to provide training materials and resources. It will also be collating all details on a dedicated Microsoft landing page on madewithmarmalade.com. This should be a one-stop shop for all developers interested in porting their games over to Windows."

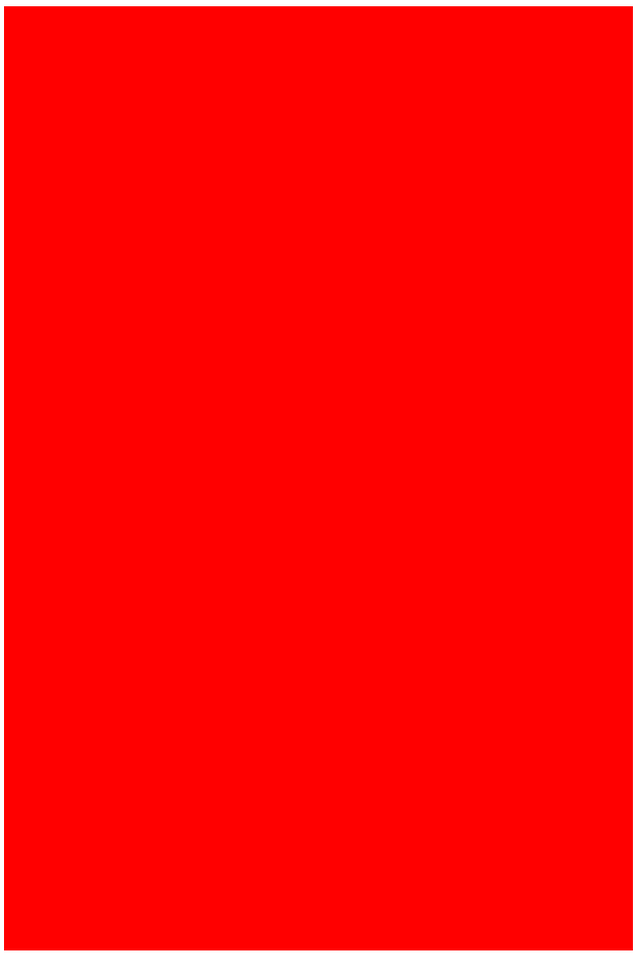
## BEING SEEN

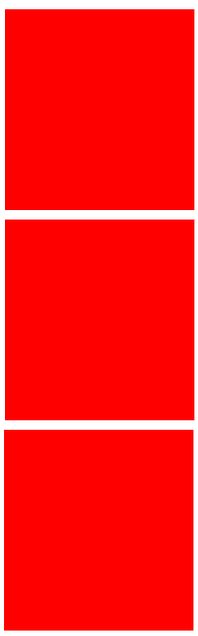
The partnership is already paying dividends for some of Marmalade's customers and developers, who are relishing the chance to quickly and effortlessly bring their games to a more promising market.

"Probably the biggest opportunities for games on the Windows platforms is the increased chance of being discovered as they aren't as crowded as other app stores," says Sports Director CEO Roger Womack. "For premium apps like *Football Director* there is also trial mode, which allows users to play the game for a short period before buying."

Paul Norris, creative director at Mad Fellows, adds: "Although the current install

*From top to bottom: Microsoft's Andrew Webber and Marmalade's Donald Beatson*





*From top to bottom: Lemon Moose's James Mintram, Mad Fellows' Paul Norris and Sports Director's Roger Womack*

base is smaller than the other mobile marketplaces, Windows Phone is growing rapidly in popularity. It's far less crowded and much easier to gain traction and get your game noticed now. There's an opportunity to make a killer app that could be front and centre as the user numbers increase."

Norris goes on to explain that another advantage is the Windows devices available – ranging from Surface tablets to various models of Nokia phone – all operate in a much more comparable way than the more varied spectrum of Android phones.

"Nokia's range of Windows phones includes great, cost effective and therefore very popular models," he says. "Creating a scalable product that will perform well on these phones and take advantage of the power of the high-end devices will dramatically increase your global install numbers."

James Mintram, director of Lemon Moose Games, agrees: "The Windows Phone platform offers great devices with a minimum specification, and fragmentation is minimal – this really helps when trying to provide a premium experience for customers.

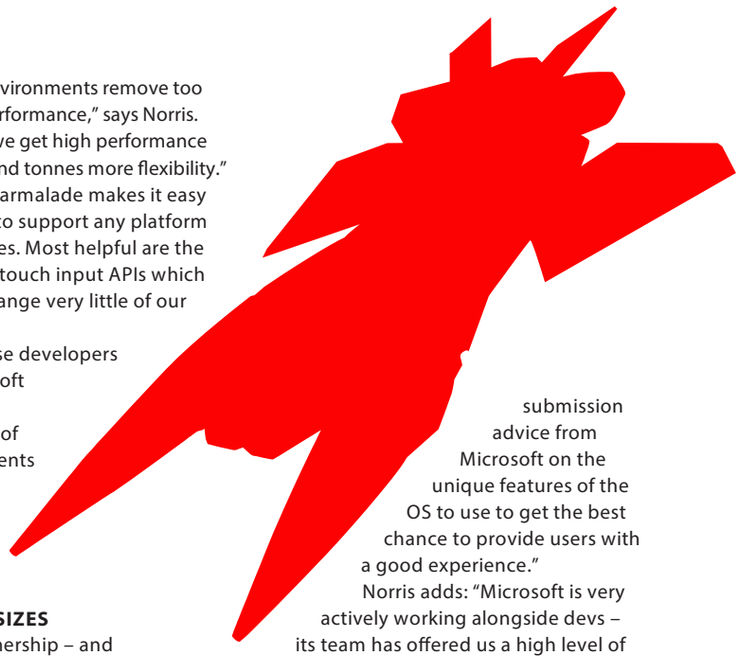
"The Marmalade Hub is also a very useful tool for keeping all of the related metadata and project settings together for a project. When you consider that there are numerous configurations generated for all the various Windows Phone and Windows 8 device configurations per project, having a central place to manage all of those eases the burden."

The Hub is just one of the benefits these developers have found working with the Marmalade SDK and its various complimentary tools.

"Our programmer prefers to work closer to the hardware with C++ and finds that new 'managed' coding environments remove too much control and performance," says Norris. "Marmalade means we get high performance across all platforms and tonnes more flexibility."

Womack adds: "Marmalade makes it easy for C++ developers to support any platform with minimal changes. Most helpful are the graphics, audio and touch input APIs which meant we had to change very little of our code and graphics."

Working with these developers as part of the Microsoft partnership has also identified a number of potential improvements for the Marmalade SDK, something the firm is currently working on.



## ALL SHAPES AND SIZES

As part of their partnership – and their own ongoing plans to attract more developers – both Microsoft and Marmalade have been quick to offer support to these studios and the waves of others now investigating the opportunities of the Windows platform.

For Microsoft, Webber says the key is to be flexible: "With the convergence of gaming across mobile, tablet, desktop, console and the web, our platforms support a range of monetisation strategies for freemium, premium and ad-supported games. There is also the ability to secure data analytics and insights from Microsoft Azure that also offers data storage, offload computation to cloud and authentication.

> ***"Microsoft and Marmalade both have hugely innovative and fast-moving technology teams."***
>
> Donald Beatson, Marmalade

"We also have great partnerships with many third-party game engines, such as Marmalade, that allow developers to easily port or develop new games for our platforms using tech and frameworks they already know and use. Lastly, developing on and for the Microsoft gaming platforms means maximum code re-usability and the ability to span across different form factors for Xbox, PC, Windows RT and Mobile."

The efforts of the two firms have not gone unnoticed by developers.

"Marmalade and Microsoft have been very supportive," says Womack. "We have had technical support from Marmalade, and pre-submission advice from Microsoft on the unique features of the OS to use to get the best chance to provide users with a good experience."

Norris adds: "Microsoft is very actively working alongside devs – its team has offered us a high level of support and guidance.

"When we were developing *SineWave* [formerly known as *Salvage*], access to Live was not available to us. Without a direct equivalent of Apple's Game Center, we found certain features difficult to implement. We were using Azure for all of our cloud systems and this turned out to be an effective workaround for many of our Live limitations."

Mintram agrees, adding that the Marmalade SDK was invaluable in overcoming some of the hurdles releasing on Windows presents to studios: "The largest barrier is a technical one. Without frameworks like Marmalade, developers are exposed to the details of implementing large portions of platform-specific code."

The partnership may be new, but Microsoft and Marmalade have already helped many developers bring their titles to Windows and Windows Phone. Going forward, Marmalade's Beatson hopes to continue working with Microsoft to help populate the promising platform as it continues to grow.

"Microsoft and Marmalade both have hugely innovative and fast-moving technology teams, so we'll keep our engineers talking to each other and continue to align our roadmaps and product releases," he says.

"We'll continue to encourage more and more Marmalade developers to publish to the Windows Phone Store and the Windows Store. What we'd all love to see are some great games from talented developers coming to Windows, thanks to being made with Marmalade.

"Every developer we talk to tells us that their biggest challenge in releasing a successful app in today's market is discoverability, getting their app in front of the consumer. So having your app available for millions of Windows users in more than 200 markets worldwide on truly competitive hardware will help maximise your chance of success. And of course, thanks to Marmalade's powerful cross-platform technology, getting your app on Windows has never been easier."

*You can find more information and documentation about developing games for Windows using Marmalade at* **developer.madewithmarmalade.com**. *Download the free Marmalade SDK from* **madewithmarmalade.com/download** ■

# CONGRATULATIONS TO THIS YEAR'S DEVELOP AWARD WINNERS.

## Using Perforce is a WIN WIN for all Game Developers

Perforce is used by 18 out of the world's top 20 gaming studios, and many more smaller studios are taking advantage of our FREE 20/20 solution. We're proud of the fact that nearly 50% of this year's finalists are Perforce customers. Our ability to version source code, as well as large binary files, makes Perforce a WIN WIN for everyone.

Version everything.

Perforce is FREE for teams of up to 20 users – "Play Perforce for FREE" today.
To take the way you work to a new level, scan the QR code or visit: **info.perforce.com/play20_20**

18
www.pegi.info

DEEP
SILVER

PS4 XBOX ONE PC

© 2014 and published by Deep Silver. All rights reserved. Deep Silver and their respective logos are trademarks of Koch Media.
All other trademarks, logos and copyrights are property of their respective owners. All rights reserved. "PS" and the "PlayStation"
are trademarks or registered trademarks of Sony Computer Entertainment Inc. "PS4" is a trademark of the same company.

20 Years of Shared Experiences

KOCH MEDIA

# #DEVELOPJOBS

**Your monthly guide to the best career opportunities in games development worldwide**


**MOVERS AND SHAKERS:**
Ian Livingstone, Michael Acton-Smith and Andy Payne take new roles
**P50**

**RECRUITER HOT SEAT:**
Reflections' Olga Bugheanu on how to get a job at the studio
**P51**

**GET THAT JOB:**
Advice from Playground Games' Ralph Fulton on becoming a lead game designer
**P52**


# Maia dev Simon Roth opening new studio

After making more than $1 million from the crowdfunded and Early Access title, the indie developer is looking for staff for his new company, Machine Studios

**by Craig Chapple**

SIMON ROTH IS opening a new studio in Oxford thanks to the success of his god game *Maia*.

Speaking to *Develop*, the indie developer says he's now looking to form a team of high-skilled, multi-talented people that can fit into his "little dynamic" company called Machine Studios.

The news comes as money received for *Maia* has surpassed $1m. This total includes the £140,000 raised from Kickstarter in November 2012, Indiegogo funding, direct sales from his website and purchases of the Steam Early Access release.

And though that game is still under development, Roth says he is now also considering working on one of three different games and a licensed title, but needs a full-time team to help with the increased workload.

And not content with just that, Roth is also contemplating becoming a publisher for small indie titles.

Though like many indie games developers Roth has previously operated under his own name for *Maia*, he says using a proper studio name is important for both prospective employees and for his growing business as a whole.

> ***"I didn't want my employees to have to put on their CV 'I worked at Simon Roth'."***
>
> Simon Roth

"The real reason I wanted Machine Studios rather than Simon Roth Incorporated is I thought it would be really narcissistic and weird, for one," he says.

"And also, I didn't want my employees to have to put on their CV 'I worked at Simon Roth', when it could be Machine Studios. And so it gives them a better thing to say what they worked for.

"And also, if you're dealing with Americans, sometimes they never understood when my trader set-up was registered in my own name, they didn't understand the concept."

One of the key roles Roth has fulfilled during *Maia*'s development is that of community management. He says he takes the time to respond to as many questions from users as possible, and also discusses issues with Steam reviewers and Reddit users, even sometimes advising people against buying his game, as it might not fit with their tastes.

Despite gearing up to take more of a studio head role, he says he'll continue writing the code for *Maia* and engaging with the community, as he believes fans appreciate talking directly to the devs, but may look into getting a community manager to ensure there's a constant link to players.

"I may get people in to do little bits of it, or try to use more middleware to try and reduce my load," he says. "But it's not like any time not working is spent wasted on social media anyway.

"So I just use the time I was going to waste on social media and use that to sort out my social media stuff. I may get a community manager in, but I think a lot of people appreciate the fact they can talk to me directly." ■

# MOVERS AND SHAKERS

**This month:** Bossa Studios, Department for Business, Innovation and Skills, Bigpoint and Mind Candy

## BOSSA HIRES THREE INDUSTRY VETS

**BOSSA STUDIOS** Independent developer Bossa has made three high-profile hires to its Board of Advisers.

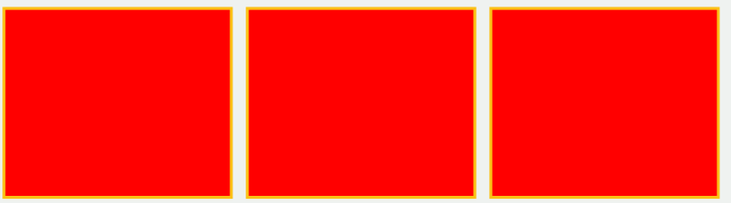
Industry veterans **IAN LIVINGSTONE CBE, ANDY PAYNE OBE** and **DAVID LAU-KEE** have joined the studio's board.

"We've been punching above our weight since we founded the studio," said the firm's co-founder and CEO **HENRIQUE OLLIFIERS**.

"From getting invested in by a great partner such as Shine mere six months into our adventure to winning a BAFTA for our debut game, and later creating the success of *Surgeon Simulator*, the advisory board is truly one of these 'I can't believe we did it' moments.

"Ian, David and Andy are personal heroes to us. The amount of wisdom one gets from a quick chat with any of them is truly remarkable, and we know better than anyone how much advice we need in these turbulent transition times in the games industry.

Payne added: "I have known Imre, Henrique and Roberta for some time and always loved the work that Bossa were doing. When they asked me whether I would like to join as an advisor, I was humbled and honoured. What Bossa has in development is awesome in so many ways and I am confident that they will build on the success of *Surgeon Simulator* showing that another UK-based games company is capable of pushing the boundaries of games development and design."



*Bossa's new hires: (From left to right) Ian Livingstone CBE, Andy Payne OBE and David Lau-Kee*

**GOVERNMENT** **IAN LIVINGSTONE'S** new role at Bossa is not his only new one this month.

Livingstone has also been appointed an Innovation and Skills Creative Industries Champion by the Department for Business, Innovation and Skills.

In this role the industry veteran will play a key role in promoting and supporting the creative sector. Livingstone already sits on a number of industry boards, including Creative England.

"British creativity is the envy of the world. Our designers, musicians, film, TV and games makers have put the UK on the world map with their talent," said business secretary **VINCE CABLE**. "They have also played a big part in driving our economic recovery. The sector now generates £71bn in revenue each year and support 1.71m jobs."

Livingstone added: "It is a huge honour to take up this position. The UK is arguably the most creative nation in the world. The sector punches above its weight and I am looking forward to helping ensure that its economic and cultural contribution to the UK is both recognised and supported."

**BIGPOINT** Online game publisher and developer Bigpoint has hired former-Zynga producer **VARUN NAGENDRA**.

He will serve as producer of *Farmerama* and will be in charge of the game's live operations. In his time at Zynga, Nagendra worked on live production for the likes of *Farmville*, *Castleville* and *Bubble Safari*.

"I'm extremely pleased to join the incredibly talented team at Bigpoint," said Nagendra.

"I'm really happy in Hamburg and I appreciate the open-minded atmosphere in the company."

**MIND CANDY** The *Moshi Monsters* studio founder **MICHAEL ACTON SMITH** is to step down as CEO.

He is not leaving, however, and will hold a management position focusing on two new projects – *World of Warriors* and *PopJam*.

Until a new CEO is found, COO and CFO **DIVINIA KNOWLES** will be serving as its president.

"I've been doing some deep thinking, and I am self-aware enough to know that I am much better on the creative side of business than on the operations side," Acton Smith said in a video.

## THIS IS WHERE WE WORK

Opening the doors to studios around the world

### Strawdog Studios

Derby, United Kingdom
**www.strawdogstudios.com**

This Derby-based studio has been behind such mobile successes as *Peppa Pig*, and has worked with the likes of Atari and Chillingo. It employs ten members of staff.

# RECRUITER HOT SEAT

Ubisoft Reflections' **Olga Bugheanu** on how to get a job at the Newcastle-based studio

**What differentiates your studio from other developers?**
Today, there is the real feeling that something special is happening within Reflections.

For the last two years we have been working on massive triple-A titles like *Watch Dogs*, *The Division*, *The Crew* and *Just Dance 2015*, while encouraging our team members to take risks and explore. This drive has resulted in some amazing prototype projects and an increasing obsession with player's needs. We are doing more to understand players, to bring them with us on this journey.

We're in the fortunate position of having the stability of Ubisoft behind us along with the freedom to use the best tools, to design new ways of making games and collaborating and establish our own frontiers.

With over 220 staff of 20 different nationalities, and this year celebrating a 30-year legacy of making games in the North East, it's a fun place to work that allows you to be your best.

**How many staff are you looking to take on?**
Right now we're looking to attract over 40 developers – people who want to be part of our future growth and share the next stage of our adventure with us. Specifically we are looking for programmers, level designers and artists.

You can find all of our current vacancies on our website: **www.reflections.ubisoft.com.**

However, if you are an expert in the industry of any discipline, we would love to hear from you. We are lucky that we attract and retain the 'best of the best', from our interns to experts.

**What surprises people when they come to work at your studio**?
Our location, Newcastle, surprises people. It's a brilliant city, with a great culture, great nightlife and it's surrounded by amazing countryside and a beautiful coastline. Reflections is also celebrating 30 years of making games this year, which is a real buzz for the whole team.

**What should aspiring devs do with their CV to get an interview?**
Be good. Be different.

Differentiate yourself from the crowd. Go to networking events, write a great covering letter.

Talk to us, we want to be surprised by your knowledge, skill and vision.

**BIO**
**Name:** Olga Bugheanu
**Title:** Talent Acquisition Manager
**Developer:** Ubisoft Reflections
**Country:** UK
**www.reflections.ubisoft.com**

> ***"Bright sparks who do their homework can't fail to impress."***
>
> Olga Bugheanu, Ubisoft Reflections

**Who is the best interviewee you have ever had and how did they impress you?**
The candidate got the easy things right, they turned up in the right place at the right time and they were completely prepared, engaged and engaging.

They brought their own work into the room and sold it with such confidence that I knew, without hesitation, they would be our next superstar.

**And who was the worst?**
We had a candidate with a great CV who had tested extremely well – we were so excited to meet with them. But when they came to the interview, we could not get them to speak. Not about themself, about the work, about their journey to the studio.

We understand that candidates can get nervous, but this was a really awkward situation for everyone involved.

**What advice would you give for a successful interview at your studio?**
Be prepared. Research the company, find out about the role and ask questions in advance of interview. Be interested in your interviewer and be articulate about the job and yourself.

Bright sparks who do their homework can't fail to impress.

**If Reflections has recruited internationally, what is the process like?**
The recruitment arena for Reflections is global. It is all about who is the best, not where they are.

We currently have 20 nationalities within the studio and we've become adept at helping employees and their families move to the UK and facilitate all the important details such as visas, and insurance.

**How have your recruitment needs changed at your studio?**
In the last year we have grown from 160 staff to over 220. We have a lot of demanding projects on the go but the challenge is always to think beyond that.

We're working to future proof the studio by both attracting seasoned experts and home-grow our own talent with a focus on interns and developing graduates.

**Why should developers join a studio like Reflections when indie and self-publishing have become so much more accessible?**
Developers should forge the path that best suits them.

Reflections is part of Ubisoft, the world's fourth largest publisher, and is using this as permission to take risks. We have a raft of projects, from triple-A collaborations to small prototypes in-house, and we're always looking for the next frontier to push.

If you're good, and you want to join us on that journey, we want you with us.

Follow us at: **@develop_jobs #DevelopJobs**
To see our full jobs board, sign up for our jobs newsletter or to post your own job ads, visit: **www.develop-online.net/jobs**

# GET THAT JOB

Development specialists offer advice on how you can bag that career leap

## THIS MONTH: LEAD GAME DESIGNER

PLAYGROUND GAMES' RALPH FULTON discusses the skills needed to head up development in his role as lead games designer on upcoming racing title *Forza Horizon 2*.

**How would someone become a lead game designer?**
By getting a lot of experience. You have a lot of responsibility. I cannot imagine making the decisions I make about game content without having the experience I have. Trust is so important and when people can see that you've been making video games for as long for the likes of Rockstar North and Guerrilla Games those around you trust in your experience.

**What qualifications and/or experience do you need?**
Any kind of degree is going to give you a better chance of getting into the industry. It takes smart people to make games and having a degree tells me that you're smart, committed and disciplined. We've also hired people because they've been very active in the modding scene or have a portfolio containing games or demos that the candidate has made by themselves.

I got into the QA department of a Scottish games company and learned first-hand how games are made. This experience helped me out considerably when the opportunity arose to become a game designer. This is a career path I'd highly recommend to any aspiring game designer.

> ***"I can't imagine making decisions about game content without experience."***
>
> Ralph Fulton, Playground

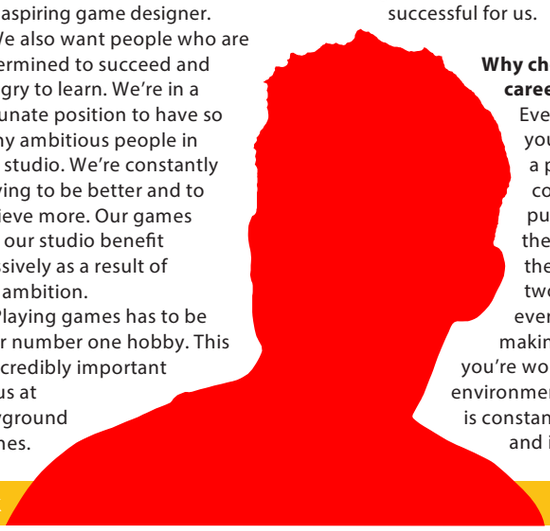
**If you're interviewing someone to join your team what do you look for?**
Senior designers need to have a more extensive skillset than entry-level designers, obviously.

However, they should have excellent communication skills. In a project's concept phase designers write pitch documents and then present them to the leadership team. Then, throughout production, they have to make sure that every person working on a feature is fully aware of what is required of them. This means that both written and verbal communication skills are essential for any aspiring game designer.

We also want people who are determined to succeed and hungry to learn. We're in a fortunate position to have so many ambitious people in one studio. We're constantly striving to be better and to achieve more. Our games and our studio benefit massively as a result of this ambition.

Playing games has to be their number one hobby. This is incredibly important for us at Playground Games.

**What opportunities are there for career progression?**
There are excellent opportunities for progression here. We have a fantastic performance management program, here. It's all about setting the right objectives for your team, providing them with everything they need to meet those and meeting to discuss progress. This has been incredibly successful for us.



**Why choose to follow a career in your field?**
Every day at work, you feel like you're a part of a creative collective, all pushing to reach the very top in their field. No two games are ever the same, so making games means you're working in an environment that is constantly evolving and improving.

If you've got job advice to share, email **Craig.Chapple@intentmedia.co.uk**

# Employee HOT SEAT

**Rob McLachlan,** senior designer at Climax Studios, talks about getting a job at the Portsmouth-based developer

**What do you do at the studio?**
I'm a senior designer at Climax. I do everything from high-level pitch work with Rhys Cadle, our design director, to good old fashioned level or systems design for any of the projects we have going on at the studio.

**How did you get your current job?**
I started at Climax in 2005 as a level designer, was promoted to lead and then left to work at another studio. Climax lured me back with the chance to work on a great project, and now I'm one of the senior members of the design team here.

**What perks are available to those working at the studio?**
The best thing about Climax is the position. The view is great and there's plenty of places to eat or drink nearby. We're not stuck on a research park or industrial estate with only a terrible sandwich van for company. We get free parking and discounts at the shops on site, too.

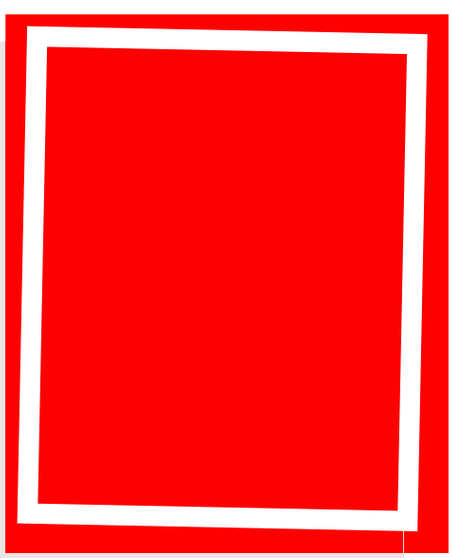
**What is the recruitment process like at your studio?**
We're always on the look out for new staff, especially Unreal experienced level designers at present. Our recruitment manager – Stuart Godfrey – reviews all our applications, and offers relevant candidates to the directors. Rhys forwards CVs over to me or other designers for our opinion, after which we'll look to bring the best people in for interview. We like to find out how people think, and how much they enjoy making games, but above all interviews are to check they're right for the position we need to fill.

**Name:** Rob McLachlan
**Title:** Senior Designer
**Developer:** Climax Studios
**www.climaxstudios.com**

**What was your own interview like?**
My return to Climax was a look at the game and meeting old friends again, but my original interview included a design test.

> ***"We like to find out how people think and how much they enjoy making games."***

For level designers we like to give a 30-minute test to draw a level out on a whiteboard. This tests all sorts of qualities – imagination, thinking under pressure, clarity of diagrams and ability to present ideas.



**Describe what the atmosphere is like at your studio.**
Busy, but very professional. One thing I like about Climax is things move fast. Decisions are taken quickly and decisively without extended meetings, and we like to test things rapidly in game to see what works. All our designers can use Unreal or Unity or both, and we have great coders who can help us try things out. It's good to see new technology like VR making massive progress at the studio.

# SKILLS AND TRAINING

**This month:** Falmouth University

**Falmouth University**
Penryn Campus,
Treliever Road,
Penryn,
Cornwall TR10 9FE

**T:** 01326 213730
**E:** penrynreception@fxplus.ac.uk
**W:** www.falmouth.ac.uk

IN SEPTEMBER, FALMOUTH University is set to launch a new BA in Digital Games, designed to educate students to keep up with changes in the industry.

The course will teach pupils the skills to work in roles including art, design, writing and sound design, and also equip them with the business skills to set up their own games development studio, should their ambitions set them down the independent route.

The University is also home to the new £1.5m business incubation programme Alacrity, which only began in May and is targeted at the digital creative industries, including games. The programme is focused on entrepreneurship and instilling business knowledge into students.

Though already launched, Falmouth aims to extend the programme in 2015 by accepting more students onto the course than the current 20 it has – whittled down from 70 applicants. As well as receiving an education in games business, the University is also looking at creating programmes in Renewable Energy and Aerospace, following the Alacrity model.

"Focused on entrepreneurship, the programme drives innovation and IP, creating new high growth businesses in Cornwall that enhances the UK and Cornwall's competitive position as the producer and user of digital applications and creative content globally," explains Falmouth University's Alacrity project manager Nick Dixon.

*Dixon says that Falmouth University's business-focused courses is helping to increase the employability of its students and grow the UK's economy*

> ***"Not every University can say they are growing the UK economy."***
>
> Nick Dixon, Falmouth

"We do this by building demand-driven businesses using the proven Alacrity methodology for commercialising technology and creating entrepreneurs."

Dixon says the focus of the programme is on creating real projects. Students will undertake a Masters' in Entrepreneurship that runs in parallel to the projects that graduates are undertaking, including games.

The 20 students on the course are split into five teams tasked with developing a project, including making unique games, gamification for multi-nationals, and e-learning programmes. Such projects can also cover the use of motion capture and virtual reality technology.

"These projects were assigned by real industry partners, including a high-profile console platform holder and a blue-chip organisation operating within the tech sector, who had identified a market-driven need," says Dixon. "Experiential learning is central to the course, enabling students to learn through working on live projects such as these.

"To guide students in their learning and develop their projects towards becoming full-fledged start-ups, students receive intensive coaching sessions and support too. Mentors and coaches are selected for their business, academic and management acumen. Right now, students are conducting due diligence and evaluations on their projects. They will be choosing which project to take through to production with their business partner."

Dixon claims the business-focused programme enables graduates to go on and build their own companies, and increase the employability of pupils who are looking to join a firm that already exists.

"We are increasing employability, growing the UK economy and exploring brand new areas of creative innovation. Not every University can say that."

*Falmouth University's Digital Games BA programme is running alongside a MA in Entrepreneurship*

## INFO

**Course:** Alacrity programme, BA in Digital Games
**Established:** 2014
**Country:** UK
**Staff:** Nick Dixon (programme director, Alacrity Falmouth)
Tanya Krzywinska (professor of Digital Games)

# BUILD

THE LATEST TOOLS NEWS, TECH UPDATES & TUTORIALS

**MOVING MO-CAP IN-HOUSE:**
Creative Assembly's Peter Clapperton on doing your own mo-cap
**P61**

**ANIMATION TOOLS GUIDE:**
We look at eight tools for all your animation needs
**P68**

**UNREAL DIARIES:**
Epic looks at the technology powering a new wave of Android devices
**P74**

# From data to drama

Motion capture has made incredible advances during the last 30 years, and is now accessible to more studios than ever. **James Batchelor** asks leading experts in the field what improvements to the technology could mean for games in future

MOTION CAPTURE IS rapidly becoming ubiquitious in games. Once a major selling feature to show how high-end your title was, it is now found in almost every blockbuster title – and even a few indie hits.

This can be attributed to significant advances made in mo-cap technology of the past few decades. *Develop* and mo-cap specialist Vicon, which celebrates its 30th anniversary this year, invited experts to London for a roundtable discussion on what these advances have enabled.

"Motion capture was always about lots of technology getting as accurate data as possible, but now that's almost taken for granted," says Vicon product manager Phil Elderfield. "Now the technology is all but invisible, and the emphasis is much more about the animation and the creative side."

Alex Counsell, principal technician for motion capture at the University of Portsmouth, says the final performance is the biggest beneficiary: "We don't have to ensure that actors are mindful that they're in a mo-cap suit and adjust their actions to fit our technology. They don't have to worry about what we're doing, they can just concentrate on their performance.

"I can look for professionals confident that the system's going to pick everything up. We can just sit back and we're almost invisible – apart from the velcro, gaffer tape and all the other fun aspects of mo-cap."

Stuart Butler, senior lecturer in computer games design at Staffordshire Uni, agrees, adding that the rising quality of motion capture means that poor performances are more obvious than ever.

"You're not just watching a bunch of green dots on a screen wondering if it's going to work," he says. "Now if students go back and shoot, it's not a case of the capture not working, it's that the guy in the suit wasn't much cop as an actor."

*Top-to-bottom: University of Portsmouth's Alex Counsell, Audiomotion's Mick Morris, Vicon's Phil Elderfield and Tameem Antoniades of Ninja Theory*

## HOW DEVELOPERS ARE USING MO-CAP

VICON AND *DEVELOP* surveyed more than 100 readers about their experiences and use of motion capture in their games. Here's what we found:

- 75 per cent of studios use in-house systems, while ten per cent don't use mo-cap at all
- 80 per cent carry out pre-viz as part of their games production
- The majority of developers believe the games industry is proficient at the artistic and creative aspects of motion capture, as well as all of the studio operations, programming and mathematics involved
- However, nearly 65 per cent believe the industry needs to improve its talent management
- Most developers agreed that both keyframe animation and motion capture are valid in games development today, concurring with our panel that the two can co-exist

*Though accurate data can be captured with current tech, such as Vicon's Blade 2 (main), experts hope in future hidden sensors will mean full performances capture is possible outside of the studio*

Motion capture has come a long way in the last few decades. Not only are the capture suits and head-mounted cameras now more comfortable and far less restrictive, leaps forward have also been seen in the back-end software. It all means studios can tackle mo-cap situations that they would never have even attempted in the past.

### MOVING WITH THE TIMES

"17 years ago, you had teams of people whose job it was to replace bad trajectories and basically join the dots," says Audiomotion MD Mick Morris. "Every shoot was tough. If anything was blocking a marker, someone had to manually sort that out by hand. So we've seen huge leaps and bounds in the development of the software and hardware, which makes that part of the process easier.

> ***"As the technology gets into the hands of new creators, we'll see more impressive performances."***
>
> Mick Morris, Audiomotion

"We'll get the odd job where you need eight to ten performers, but we now have the technology to handle that."

Ninja Theory's co-founder Tameem Antoniades adds: "When we started, you usually captured the body and then animated the face or used ADR for the voice. Now we're moving towards a full-scene capture: multiple actors using face, body and voice – even the cameras. We're trying to figure out if we can capture the focal length in cameras and recreate every creative decision on set."

The advances in motion capture software, and the other development tools it interacts with, means that studios can see the final result of their shoot much quicker than in the past.

"With things like Unreal and whatever, the quality you can have in real-time is amazing," says Counsell. "It used to be a bit of a mystery: you had to wait a week before you could see what the data looked like and decided whether or not to re-shoot. Now you can make those decisions on set."

But Antoniades warns that motion capture should never replace keyframe animation.

"We keyframe all gameplay and use motion capture for all drama," the chief creative ninja says. "You could use mo-cap for walk cycles or incidental animations, but when it comes to gameplay we need to do so much tweaking on the mechanics and the responsiveness that if you motion capture it, you end up effectively turning it back into keyframe.

"At the early stage of *Heavenly Sword*, we hired stunt men and wires and had them simulate explosions, fly through the air and do all sorts. But in the end we replaced all that with keyframe, because somebody flying through the air on wires looks like someone on wires."

### FILMIC QUALITY

As the experts discuss different motion capture experiences they've had on past projects, Vicon's Elderfield observes that the methodology is becoming similar to that of another industry.

"It's becoming more like the standard film-making process," he says. "When you get a couple of video cameras, crew, directors and performers, there's still a lot of tech involved on any shoot, but it's well understood and the processes are very well defined, and that's beginning to happen with motion capture."

With such improved understanding of how the process works, and the increased

accessibility of the tech involved, a number of studios are investing in their own solutions. But Butler doesn't believe the process will be brought completely in-house any time soon.

"A lot of the developers I talk to have a mo-cap studio on site but they use it for prep," he says. "They don't actually use it for full-on development – they go out externally to another site or they get someone else to do a lot of it for them and work with professionals."

Morris concurs: "It's been the case for a long time that developers will buy a small system or mo-cap suit, stick and animator in it, and use them for rapid prototyping to see if certain things work. If so, you put it on the list of things to be shot at a bigger studio.

"But there's a certain things you can't do in-house: if you need a lot of stunt work, or height and big volume stuff, that's where a service provider comes in. We're still kept busy with things like sports games that need a big area for a footballer to run or someone to play cricket. We did a job a while ago – it wasn't for games – where we were capturing two horses and a chariot going at full pelt.

"For big scale stuff like that and cinematics, service providers are still needed."

### MOVING OUT

Antoniades adds that mo-cap specialists develop this technology much more effectively than any games studio could in-house, making the benefits obvious.

"Yes, it's expensive to have a lot of people under one roof for four-to-six weeks, but the benefit is you end up with a cut of your entire game and all the cinematics," he says.

With the technology behind motion capture already more accessible and convenient than developers could have ever hoped, what's the next step? What barriers remain that prevent studios from utilising this high-end tech?

"The barrier used to be the cost of entry, but that's disappearing," says Morris. "As the technology gets into the hands of new creators that can get their hands on the gear, we'll begin to see more impressive performances."

Elderfield adds that mo-cap isn't restricted to use in studios anymore: "It's starting to move outside, it's starting to move onto sets and all over the place. As we move towards simplification at the production user-end, I think we'll end up with a system that's much more invisible and much more mobile."

There are still technical hurdles to overcome however that could improve the efficiency of motion capture. The process can still be a slow one, partly due to the set-up time required.

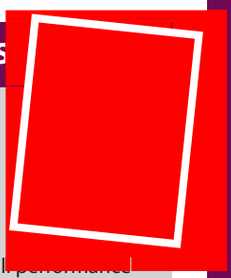
"I'd like to see that time reduced," says Butler. "If we move our cameras, we've got to refocus them. There isn't an exact science with that, it's just about going in and fiddling. The biggest shift would be the ability to very quickly set up wherever you are, within an hour rather than four."

Meanwhile, Antoniades dreams bigger: "I'd like to see a future – which might be ten, 15 years off – where we're not capturing dots, markers or paint on the face, but everything: the clothing, the way it wrinkles.

"I would love to see a future where we can capture a massive amount of data but all the sensors are hidden, so you can shoot outside and on location with the right lighting."

Only time will tell if this will come to pass, but given the leaps forward made in the last 30 years, it's a safe bet that motion capture will become even more advanced in the next 30. ■

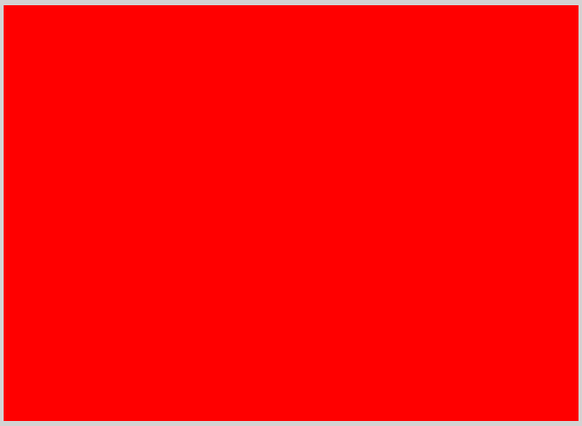
## CASE STUDY: ROCKSTAR GAMES



**Peter Busch, VP of business development at the Develop Award-winning Faceware Technologies, talks us through its ten years of mo-cap experience with Rockstar**

ROCKSTAR HAS BEEN a pioneer in leveraging full performance capture to get the most of its cinematic experiences. Post mortems, constant study and optimisation allows the firm to be on the bleeding edge of mo-cap, and performances in its games are rock solid.

Anyone wanting to adopt motion capture should learn how Rockstar does it. Rehearse first; all of Rockstar's actors not only know their lines, they know the blocking, intent and context for effective delivery. Many actors experienced in film and on-camera lack the expertise and knowledge for what is necessary for effective mo-cap.

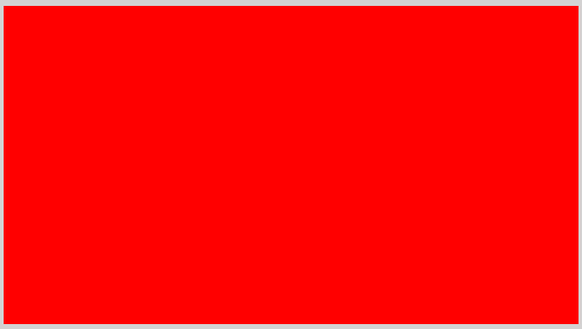


In mo-cap, the 'camera' is always on so they cast actors with stage experience as well, as effective mo-cap sometimes occurs when the talent is not the main focal point. Rockstar uses talent from the Screen Actors Guild and AFTRA, and it shows. Their actors always embody their characters – something that comes across with Faceware's video-based facial mo-cap software.

Second, they have the right personnel on set: directors and stage supervisors who know how to direct live talent effectively. This combination of casting, directing and embracing technology has put Rockstar at the forefront of motion capture in gaming.

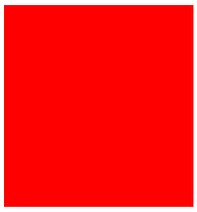
Third, Rockstar uses mo-cap for more than just what ends up in the final product. They provide cinematic 'pre-viz' to the facial animation team, giving them more context and allowing them to focus on what is most important. One major factor that often gets overlooked is head-pose. So much emotion and delivery is in the position and motion of your characters' head.

As tech evolves, game and cinematic directors will be able to make more effective story-telling decisions, leading to better quality narratives. We are excited to see how Rockstar and the industry embrace things like Faceware Live, our real-time facial mo-cap software. Rockstar already uses our beta version to capture performances with four to six people. Look out for what's next from them; with the addition of Faceware Live, I have no doubt it will exceed *GTA V*.



# Taking motion capture outside the studio

OptiTrack's marketing director Seth Steiling discusses how mo-cap tech is being applied beyond video games



*OptiTrack's Seth Steiling (above) believes motion capture technology can accomplish a lot more outside of its traditional application as an animation tool*

THANKS TO FILM and game projects like *Dawn of the Planet of the Apes*, *Avatar*, *Beyond: Two Souls*, and *Call of Duty* – as well as consumer technologies like Kinect – motion capture has captivated popular culture as a widely-used tool for animation and virtual production.

What many mo-cap enthusiasts don't know is how extensively the technology has been adopted outside of the traditional animation space. Biomechanists, virtual reality visionaries and roboticists alike are deploying motion capture to track the world around us in unthinkable ways.

Here are some recent, ingenious uses for mo-cap that have left us shaking our heads:

### PUSHING THE LIMITS

At this year's Indianapolis 500, we saw Arrow Electronics' SAM project utilise motion capture in a real-time, outdoor application to enable quadriplegic Sam Schmidt to drive an Indy 500 pace car at 172 km/h – using only his head. Similar to a PC gamer using TrackIR in *iRacing* or *rFactor*, Schmidt controlled both acceleration and steering with subtle head movements, which were tracked with sub-mm precision using a marker-based optical system mounted on the car's dashboard.

The technical wizards at KMel Robotics are also pushing the limits of mo-cap outside the studio, with an artistic short film for Lexus that captured swarms of flying quadrotors roaming city streets while its citizens slept. To control the custom-engineered robots, KMel used motion capture to simulate GPS. The quads' 6DoF data was tracked by dozens of cameras and then streamed to a control computer that utilized KMel's advanced algorithms to direct their trajectories in unison. The result was a lifelike rendering of swarm behavior that blurred the lines between technology and sentient life.

Miley Cyrus' "Bangerz" tour has incorporated one of the more ambitious recent applications of motion capture, combining real-time performer and prop tracking with projection mapping to visually spectacular effect.

> ***"These creative uses of mo-cap demonstrate that we've only begun to scratch the surface."***
>
> Seth Steiling, OptiTrack

Engineered by VYV's team of scientists and technical artists, the solution projects kaleidoscopic video imagery onto a variety of on-stage surfaces, ranging from Cyrus' attire to flat panels and giant inflatables. VYV's system uses mo-cap data and 3D modeling of the entire set to seamlessly solve for projection surface position and orientation, as well as deformation.

### STUNT SHOW

Boutique mo-cap studio Animatrik Film Design is known for pulling off immensely challenging on-set shoots that most studios wouldn't even attempt. Recently, they moved their mo-cap stage up into the mountains outside of Vancouver to capture renowned mountain biker Brandon Semenuk performing flips and double tail whips at over 40' off of the ground.

These challenging shots required cameras to be aimed straight at the sun, clouds and the sky – conditions that would traditionally cripple an optical mo-cap system.

Animatrik was put to the test in other ways, as well, as a cantankerous mother bear and her cubs paid a visit to the set mid-shoot. Fortunately, the team came out with limbs intact and impressive mo-cap data to show for it.

Motion capture has also enabled technologists to improve the accuracy of the latest immersive gaming and virtual reality control systems. Machine learning researchers at Microsoft utilised an optical mo-cap system to record thousands of movements and gestures in order to teach Kinect v2 how to track body movements more accurately than its predecessor did.

The bottom line: these creative uses of mocap demonstrate that we've only begun to scratch the surface of what the technology can accomplish outside of its traditional application as an animation tool. ■

**OptiTrack** is a developer of high performing 3D tracking hardware and software for industry leaders in game and film production, university education and research, and many others.
**www.optitrack.com**

develop
DIRECTORY

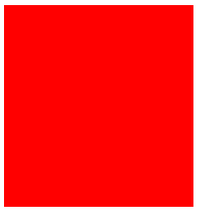
GREAT
ADVERTISING
OPPORTUNITIES

CONTACT: ALEX
Alex.Boucher@intentmedia.co.uk

T: 01992 535 647

# Capture is not animation

Cubic Motion's **Simon Elms** explains the important decisions that must be made before considering motion capture



*According to Cubic Motion's Simon Elms (above) there are a number of factors that go into facial animation*

WE PROVIDE SPECIALIST facial animation services to many of the world's largest games developers. Most of the time, some type of performance capture is part of the pipeline and, as a result, new clients will often inquire about 'capture technology', wondering how ours compares to others.

Cubic Motion isn't a vendor of capture technology. We create solutions – usually service-based – for delivering large volumes of high-end facial animation quickly. We're not tied to any capture method. So we spend quite a lot time explaining to developers that they're on the wrong track if their first task is to survey capture technologies.

The reason for that is performance capture isn't animation. You can have the most powerful capture system ever seen and achieve nothing. Likewise, some developers produce great results without any capture at all. Misunderstanding the role of capture remains a major source of confusion, lost cost, and wasted effort for too many developers.

We've always believed that any project in facial animation should start with a vision of what you want to see on the screen. Forget about capture at this stage – just decide how you want it to look. Is it photorealistic? Is it even human? Should it by stylised? Are you trying to produce perfect replicas of real physical actors, or novel characters?

Once you've made this choice, you must move on to facial rigs. There have been a few examples of rig-free facial animation based on dense scanning, but we consider them impractical and far too limiting. Any visual advantage a rig-free system may have had has gone. Modern rigs can achieve the same results and better.

### THE REALITIES OF RIGS

Use great rigs. You won't make a more important decision, but here's the unfortunate truth: great facial rigs are very hard to build. A common mistake is to collect a set of scans (FACS poses, for example) and assume that some basic processing will yield a set of blendshapes (or whatever) to do the job. It's much more complex than that.

> ***"You can have the most powerful performance capture system ever and achieve nothing."***
>
> Simon Elms, Cubic Motion

A great rig must be thoroughly decomposed into isolated controls so that it's able to generalise to any shape required. If you've got a game to make, and don't have a brilliant rigging team in place already, our advice would be to outsource it to experts.

Once you're happy with the rigs, and satisfied that your game engine can handle them, it's time to consider capture options. Most developers tend to choose some form of head-mounted camera system. You can opt for single or multi-camera systems, and various other configurations.

The natural assumption is that more cameras must produce better results, but it's not that simple. Many factors determine how well performance capture will work, but if you've worked on the capture stage itself, you'll probably realise that stability and ease-of-use are very important. If a complex system shakes too much, or is uncomfortable to wear, you may find the benefits of extra cameras are outweighed by the problems.

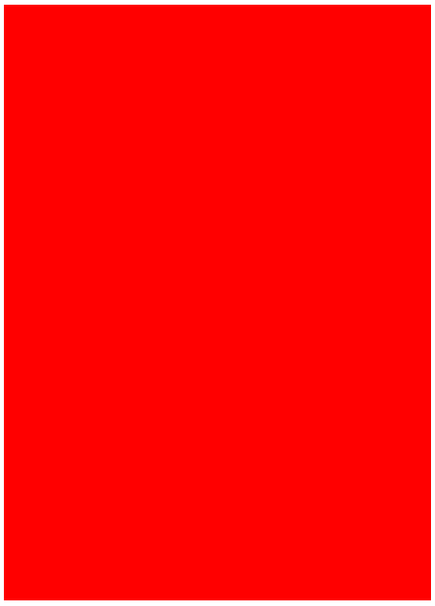
The better your rig, the less complex your capture needs to be. When clients test with us, they're often (pleasantly) shocked by the quality of results from a single-camera system. In many cases, this quality will already exceed the expectations they had from a multi-camera system, and, therefore, they choose this most simple solution.

That's not to say there isn't a place for multi-camera capture, or other types of capture – even old-fashioned marker-based mo-cap. The point is simply that you should start with the end in mind, and then work backwards. What do you want to see on-screen? What rig do you need to build to deliver that vision? Then lastly, what type of capture best balances the optimal data to drive that rig, and the convenience and robustness during filming?

Finally, don't try to make all these decisions yourself – trust experts who've done this time and again. ■

# Making your own motions

Creative Assembly's motion capture manager **Peter Clapperton** discusses the advantages of bringing mo-cap in-house



THE *TOTAL WAR* series has complex and varied requirements for motion capture which have only become greater as the series has matured. As a result, we've had our own Vicon Motion Capture Optical system in place for well over a decade now.

In the early days, this was just a handful of cameras that used to come out of a cupboard once a year. We had no capture space of our own, so we'd set them up in the local school hall to capture as much as possible in summer.

However, our current set-up bears little resemblance to those early days. It's a dedicated facility, the largest studio-owned in Europe we believe, featuring 48 cameras, ranging from four to 16 mega pixels, and a generous 128m$^2$ volume that we use daily.

## MOVING IN-HOUSE

It's taken a long time to build up to this sort of capacity, but having a system such as this under our control is priceless.

It's a five-minute walk from our main development studio in Horsham, and there's a constant flow of animators venturing over to grab anything from a simple half-hour capture for a short cutscene, to complicated full-day shoots; from standard locomotion sets to live, real-time streaming within specific environments. Given the volume of projects that Creative Assembly has on the go at any one time, and the fact that we expanded our client-base to other studios under the Sega banner, we're kept pretty busy.

The benefits of having our own system – as opposed to outsourcing – are twofold. First is the ease of accessibility and the quick turnaround of data we can achieve. Our animation and cinematics teams utilise the mo-cap studio for pre-visualisation work, and are able to rapidly prototype animations without any of the concerns of throwaway data. You can always come back and do it again.

> ***"You can go from conception, to capture, to implementing mo-cap in-game on the same day."***
>
> Greg Alston, Creative Assembly

As an example of our ability for a quick turnaround of data: one morning we set up an environment in MotionBuilder for *Alien: Isolation*, calibrated the system and actor, captured the required scene and provided the animation team with 12 minutes of clean data before lunch.

The second benefit is the general, overall reduced cost of having our own, dedicated mo-cap studio. It's in constant, full-time use, and has essentially paid for itself already, so we feel it's been a wise investment.

Chris Southall, lead animator on *Alien: Isolation*, states: "It allows you to be really flexible with your ideas and means you can try and try again without the expense of sourcing actors and a venue. An animator can just put on a suit and get what they want almost instantly. It also allows you to experiment with new ideas in motion capture performance, without the hard deadlines and the overall cost of external motion capture studios."

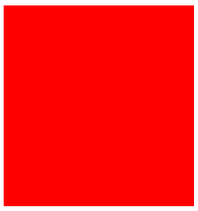
*Total War* lead animator Greg Alston adds: "The benefit of an internal mo-cap studio is the turnaround time; you can go from conception, to capture, to implementing it in-game on the same day."

## READY FOR ACTION

Having our own studio also enables us to devote some time into R&D for future projects and allows for a dedicated team to focus on making streamlined pipelines tailored to our projects. The skillset of the team is such that there is a nice blend between character set-up, motion capture and animation, and the teams can work together to generate best practices.

We also have dedicated actors and fight performers that we use on a regular basis who work closely with us on specific fight sequences and styles in preparation for a shoot.

Preparation is everything, along with a passion for what we do. And since the update to Blade 2, the latest version of Vicon's proprietary software, we have seen a dramatic increase in the use of real-time streaming to aid the director's vision, working with live characters within their own environments. ■



*Creative Assembly's Peter Clapperton (above) says the studio has steadily grown its motion capture facility (main) over the years, and it now stands as the biggest studio-owned mo-cap house in Europe*

# Powering up mobile

Developers are increasingly looking for ways to squeeze out more power from mobiles as they try to differentiate their games on crowded app stores. **Craig Chapple** asks how studios can bring high-end gaming to smartphones

*Top to bottom: Geomerics founder Chris Doran and PlayCanvas CEO Will Eastcott*

*Main: The success of games like CSR Racing show that there is big demand for high-end gaming on mobile*

AS MOBILE TECHNOLOGY as a whole continues to evolve at pace, with Apple and the likes of Samsung consistently releasing new hardware to outdo their competitors in the power stakes, so too does gaming.

Ten years ago the notion of high-end graphics on mobile devices would have been laughable, but flash-forward to today and the technology powering mobile has moved on leaps and bounds, and stunning visuals can mean big business for the right games.

You only need to take a look at companies such as NaturalMotion, which built its games development business on high-end gaming through titles such as *MyHorse* and *CSR Racing*, to see the fruits of such endeavours. Such was its success, Zynga bought the firm for over half a billion dollars at the start of the year.

## REACHING NEW HEIGHTS

Matt Spencer of ARM, a company that specialises in the creation of development tools and the technology powering mobiles, such as the Mali GPU, says mobile hardware is fast becoming more a fashion statement in the way it looks both physically and what it displays.

"This requires a high-quality display with high pixel density and CPU cores able to achieve a balance of high performance and efficiency paired with a high fidelity GPU to ensure consumers receive a silky smooth user experience," explains Spencer.

"And once the consumer has bought into the high-end experience and has a mobile device that is capable of console quality gaming, their expectation is that when they pay for a game, it will make full use of the capability of the device they have."

Chris Doran, founder of game lighting specialists Geomerics, says consumers have always sought out the best visuals, right from the earliest gaming handhelds through to the PS Vita and today's tablets and phones, and he doesn't see this trend ending any time soon.

> ***A significant portion of people want high-end games and devices will emerge that target them.***
>
> Chris Doran, Geomerics

"For mobile we are entering into a different space now," he says. "Historically, mobile gaming meant a dedicated platform designed around games. That is no longer the case for smartphones and tablets. These are consumer devices that are designed to fulfil many roles, only one of which is gaming. This can complicate things for the consumer, but we have been here before.

"In the PC space, gamers had to fight for attention with other use cases. This ultimately resolved itself with more specialised high-end hardware being developed predominantly for gamers. GPU progress in particular was driven by satisfying the needs of high-end gamers.

"I'm sure the mobile space will develop along similar lines. Not all consumers will want to play high-end games on their mobile devices, but there will be a significant portion who do and devices will emerge that are targeted at their needs."

Martin Ekdal, VP of business development at Donya Labs, creator of automatic optimisation solution Simplygon, adds: "I think 3D games are much more interesting. I'm not saying that 2D games are shit, because there's a lot of really cool 2D games, but there's just way much more you can do and much more things to explore in 3D."

## ADAPT OR DIE

As Ekdal says, 2D games or even minimalist titles can still find both niche and mass-market audiences. But as the app stores continue to get flooded with hundreds of thousands more games, visuals can act as an effective way to pull in players. After all, game mechanics don't speak for themselves until users begin to evangelise the titles.

Will Eastcott, CEO at cloud game development platform firm PlayCanvas, says if developers don't adapt, others will, but adds there are plenty of tools available to use to keep up with the latest developments.

"For example, the PlayCanvas engine is built on top of WebGL 1.0, but version 2.0 is already on the horizon," he explains. "The new API integrates features like multiple render targets, geometry instancing and new compressed texture formats, all designed to squeeze more

performance from the GPU. When PlayCanvas finally incorporates v2.0, developers should simply see a performance boost and not spend weeks rewriting a proprietary game engine.

"That said, even if you use a commercial engine, I'd argue it's still important to understand how the hardware is being driven. Companies like ARM produce some fantastic tools like the Mali Graphics Debugger which provide this insight."

Doran agrees that a wealth of tools are available including its Enlighten tech, and says many are tuned for the speedy development and iteration-based game creation required for mobile.

**IN WITH THE OLD, IN WITH THE NEW**

Despite powerful new tools taking advantage of the latest hardware, developers targeting a large market aren't always able to target high-end devices for the best graphics possible. Whereas consoles have much lengthier generations than smartphones and use a single base spec, there are a plethora of mobile devices old and new, built by numerous different manufacturers.

It's an issue that Spencer admits means developers targeting high quality 1920 x 1080 displays will be "cutting out 91 per cent of their potential market".

"There are a number of high-end devices in the market with very high density screens and a games developer is always going to want to make sure that their flagship product looks great on these devices," he says.

"But the truth of the matter is that the volume is to be found in the mid-range devices. If you take a look at publicly available stats from Unity, they show that the most popular screen resolution for playing unity games is on a screen resolution of 800 x 480 and the most popular mobile GPU model is still the ARM Mali-400 GPU."

Ekdal adds: "If you want to reach the full potential, then yes, obviously [you need to target legacy devices]. Everybody won't immediately get the latest hardware and if you look at certain markets, they might not ever be up to date, so there's some kind of legacy."

Another issue in the mobile market is that of power consumption, a challenge for developers looking to squeeze as much power out of the hardware for their high-end games as possible. After all, mobile devices have a number of uses, many social, outside of games, and titles that bleed dry the battery will not be welcome by many players.

> ***"The truth of the matter is that the volume of players is to be found in the mid-range devices."***
>
> Matt Spencer, ARM

Eastcott identifies some of the major culprits when it comes to the dreaded battery drain, but offers potential solutions to avoid the problem completely.

"If a developer is writing a game against native APIs, there is explicit control over how hardware features are accessed," he explains.

"Utilising the radios, GPS receiver, accelerometers and so on will all drain battery life and there are guidelines for using these resources efficiently. Things are a little different if you have opted to develop on HTML5 and WebGL.

"In this case, it is the browser – or native wrapper – that is responsible for ensuring that hardware resources are managed intelligently. For obvious reasons, the major browser vendors take power consumption seriously and are working very hard to preserve battery life."

**POWER UP**

ARM's Spencer says the firm is constantly looking at creating more power efficient architectures for mobile devices, but admits this does not absolve the developer from making power efficient applications.

The company offers a number of tools to this end, including internal compression techniques such as Adaptive Scalable Texture Compression, the Mali Graphics Debugger and the DS-5 Streamline.

"The conflict between the performance demanded by the high quality of texture, lighting and effects of 3D gaming workloads and the increasing demand for better battery life calls for a commitment to deliver the most out of every milliwatt," says Spencer.

"ARM has been driving advanced power management techniques such as ARM big. Little to save power in mobile SoCs, where high performance 'big' cores are paired with high efficiency 'little' cores. The operating system is able to run workloads such as games by using the right core for the right task.

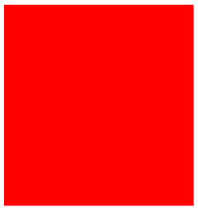
"This comes in handy when the visuals and games you are designing have complex scene content, smaller tiles and short render times."

With companies like ARM, Simplygon, Geomerics, PlayCanvas and a host of other firms around the world working on solutions and enhancements to mobile, smartphones could continue to close the gap on console quality graphics during the coming years. ■

*A number of tools are available for mobile game development, including Simplygon (top) and Enlighten (above)*

# Inside the System

23 years after the original release, Miles Sound System has entered its tenth iteration. **Will Freeman** talks to the developer shaping the future of this icon of game middleware about what the latest version has in store for developers



*Miles Sound System principal developer Dan Thompson (above) says the latest version (main) focuses on the sound designer as a valid consumer, as well as the traditional sound engineer*

MILES SOUND SYSTEM is something of a founding father of the concept of middleware. While RenderWare's 1997 release arguably established the contemporary middleware concept proper, audio tool Miles Sound System has been available in various forms since 1991.

Over the years it's been used in many thousands of games, straddling several console generations and helping shape the way many of today's most prolific game audio specialists practice their craft.

Formerly known as Audio Interface Library, and welcomed to the RAD Game Tools stable back in 1995, edition ten has just been released, taking the tool as much into the realm of the sound designer as that of the sound engineer.

As such, the tenth edition is something of a milestone for both Rad and the concept of middleware. So what better technology to place under the watchful eye of *Develop*'s tools microscope?

We caught up with Dan Thompson, the man at the reigns of this icon of game sound design and engineering.

> ***The Miles Sound System 10 was designed to provide more tools for controlling what gets heard.***
>
> Dan Thompson, RAD Game Tools

**Firstly could you tell us a little about your role on Miles Sound System today, and your history working on the middleware?**
I am the principal developer on the Miles Sound System these days. I was hired to design and develop the high-level toolset that new games and sound designers demand.

**Before we get into the finer details, is there a general or broad theme in terms of the direction you've taken with Miles Sound System 10? Perhaps there was a specific mantra or ethos to the way you've advanced the middleware?**
Miles has historically been targeted towards the engineer, and in Miles 10, I wanted to really focus on the sound designer as a valid consumer. To this end I've really iterated on the UI, and focused on representing concepts in a manner familiar to people other than programmers. This is also reflected in somewhat of a shift in philosophy with Miles, as it has historically been very much a middleware where we provide you a set of tools and leave many high-level concepts for you to implement in your own unique way. With a strong, high-level toolset many common concepts are now ready to go 'out of the box'.

**And how do those changes reflect current trends in game audio? I presume you've had to consider future-proofing Miles Sound System 10 with regard to those emerging trends?**
The demands on sound designers in games have been increasing and will continue to increase. A strong high-level toolset that puts as much of the power as possible in the designer's hands will increase efficiency during production, allowing for higher quality soundscapes. In addition, as games

become more complex we see more and more entities in the game world vying for parts of the player's ear, and Miles 10 was designed to provide more tools for controlling what gets heard.

**How did you make sure the changes introduced are what's needed by today's game audio professionals? Was it a matter of working with long-standing developer partners, for example?**
One of the great things about working with RAD is I do the support as well as the development, so over time I generate a list of features that are desired but not yet implemented. Over the course of developing Miles 9, many features were desired that didn't 'slot in' to the old Miles architecture, so a new version was required.

**Famously, of course, Miles Sound System has been around since 1991; effectively the dawn of middleware. Is any of what defined Miles back then still key to the middleware today?**
I would say that RAD's greatest strength is its support, and no matter what version Miles is on, that will remain a pillar. It's hard to compare the Miles from pre-Pentium days to the software package it is today. Back then, CPU cycles and memory were both very precious, and sound card compatibility was critical. Nowadays it's all about streamlining production and ensuring that all production personnel have no problems doing what needs to get done.

**Moving into the detail, what are the most significant new features introduced to Miles Sound System 10?**
Miles 10 has a huge list of upgrades – too many to list. The most important is a focus on buses, and providing tonnes of controls on routing audio.

In Miles 10, each sample can have multiple outputs or 'sends', each of which can have their own sends, with filters allowed everywhere. Each of these buses is also responsible for voice management, providing tonnes of knobs to control how many things are audible at any given moment.

> ***"Project set-up has been streamlined, and low-level code integration is straightforward."***
> Dan Thompson, RAD Game Tools

**So who is your core market, in terms of the types of studio you supports? Does Miles Sound System 10 offer much to smaller teams, or is it best suited to triple-A teams?**
Miles isn't picky - it can handle any team.

**And for a studio embracing Miles Sound System 10 for the first time, how do you think it will impact the working process?**
We are expecting it to be a fairly easy transition. Project set-up has been streamlined, and for studios utilising the high level toolset, the low-level code integration is very straightforward.

Getting started is more or less opening Miles Studio and dragging in sound files, and iteration is simple since you can edit while the game is running.

**What about old hands who've worked with Miles Sound System for years? How have you assured that the migration to the new release 10 will be as painless as possible for them?**
It'll be a bit more work than what they are used to, however the old functions have analogous counterparts in the new API.

Since Miles Sound System 10 is such a large upgrade in terms of functionality, we've taken the time to clean up the customer-facing functions. I think old hands will love how easy and intuitive the new API is for them.

**And what would you say to anybody still unsure about fully embracing Miles Sound System 10?**
Miles 10 has a lot of improvements. We encourage anyone who is on the fence about it to get an evaluation from us. Hands-on experience will trump an incomplete list on paper any day. ■

*Developers can arrange a free evaluation by contactingsales3@radgametools.com or calling +1 425 893 4300.*
**www.radgametools.com**

*The Miles Sound System 10 (below) features a huge list of upgrades with a focus on buses to provide a host of controls on routing audio*

# Bring animations to life

Ensuring seamless animations to your game characters is essential to creating an immersive experience. **Craig Chapple** has put together a guide of 12 tools to help you create the most believable character movements

## MORPHEME WITH EUPHORIA

**Company:** NaturalMotion
**www.naturalmotion.com/middleware/euphoria**

MORPHEME WITH EUPHORIA allows developers to create characters that can accurately react to obstacles in the game environment.

Morpheme is an animation engine and tool-chain for character animation, providing tools for marking up and organising data. Euphoria is a runtime tech that builds on this by dynamically generating character motion at runtime, enabling them to interact with other characters and the environment around them.

## HUMANIK

**Company:** Autodesk
**area.autodesk.com**

HUMANIK CAN BE used for creating real-time character animation for games. The software features a full body inverse kinematics system and real-time retargeting technology to enable characters to interact realistically with and procedurally adapt to game environments and other characters in real-time.

The latest release introduces a Creature Solver, a modular solver that enables IK computation on non-human characters with multiple limbs, tentacles, antennae or mandibles.

## FUSE

**Company:** Mixamo
**www.mixamo.com/fuse**

FUSE IS PART of Mixamo's end-to-end character creation tool suite, allowing developers to create 3D characters from a library of body parts. In total, the suite features more than 60 body parts, 90 pieces of clothing and 25 smart texture substances, powered by Allegorithmic's Substance.

Characters created using Fuse can be exported as OBJ files or uploaded to Mixamo's online 3D character rigging and animation tools. All models created within the tool can be used royalty-free by the developer.

## MODO 801

**Company:** The Foundry
**www.thefoundry.co.uk/products/modo**

MODO 801 IS the latest version of the animation, 3D modelling, sculpting and effects and rendering toolset.

New additions to the animation workflow of the tool include time markers and onion skinning. Animators can also load standard mo-cap formats or transfer existing Modo character animation using the retargeting toolset. Rigging has also been updated to include new Wrap Lattice and Bezier Deformers, enabling animation on hi-res objects.

## HAVOK ANIMATION STUDIO

**Company:** Havok
**www.havok.com**

FORMERLY KNOWN AS Havok Behaviour and Havok Animation, the Havok Animation Studio provides tools and runtime SDKs for character animation. The tech can be integrated into the Physics tool for ragdoll driving, blending and mixing.

Features include the ability to manage animation quality, quantity and speed with a number of popular codecs, and enables developers to re-purpose existing content from one character to another with runtime retargeting and mirroring.

## IKINEMA RUNTIME

**Company:** Ikinema
**www.ikinema.com**

IKINEMA RUNTIME IS a full-body inverse kinematics software that can be harnessed to create real-time animation during gameplay on any fantasy creature or human.

The technology can be used to reduce animation load on blend trees by animating the characters using full-body IK in the game. The SDK works as part of established animation pipelines, providing a full-body rig that can be used to quickly and efficiently animate any characters in your game.

## EMOTION FX 4

**Company:** Mystic Game Development
**www.mysticgd.com**

EMOTION FX OFFERS a real-time, cross-platform character animation software development kit that can be plugged into any 3D engine, game or other applicable product.

The fourth iteration contains a fully artist-focused editor to set up complex character behaviour, with extensions of the API to handle the extra functionality from the previous version of the tool.

Other functions also enable devs to add more details and expression to character, including lookat and IK.

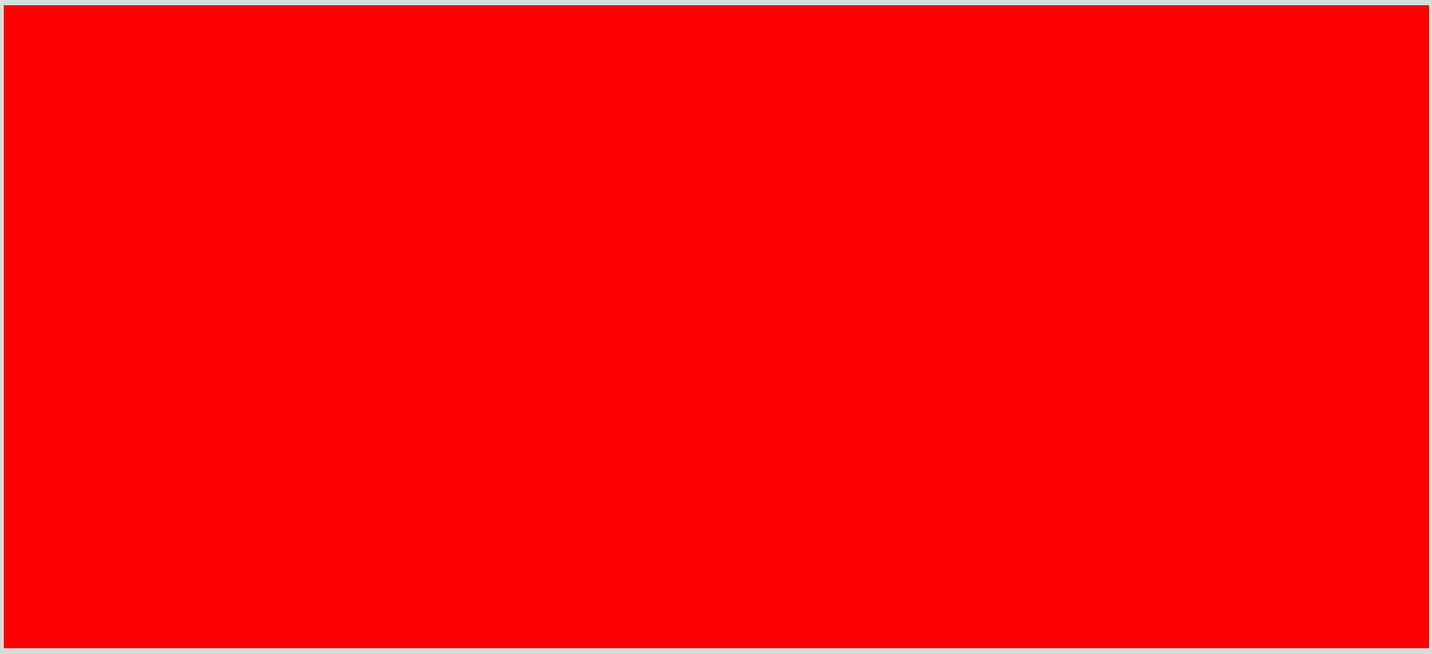
## SPINE

**Company:** Esoteric Software
**www.esotericsoftware.com**

ESOTERIC SOFTWARE'S SPINE animation tool is designed specifically for 2D games.

The tool works by attaching images to bones and then animating them, which it claims has numerous benefits over frame-by-frame animation, including smaller files sizes, fewer required art assets and a smoother animation frame-rate.

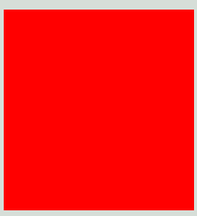
Features include a dopesheet providing a detailed view of all the timelines that make up an animation, meshes and free-form deformation.



KEY RELEASE

# Get your game face on

We take a look at Dimensional Imaging's all new DI4D Head-Mounted Camera, and what it can offer developers



*Dimensional Imaging CEO Colin Urquhart (above) says its new DI4D HMC (main) still offers high-fidelity facial capture despite being available in a more compact package*

AS THE EXPERTS in this month's motion capture special discuss, facial performance is becoming more and more important to high quality characterisation in games.

And to convey the best performance, actors need to be untethered from cumbersome technology. While plenty of full-body capture solutions have concentrated on making themselves lighter and less restrictive, Scottish firm Dimensional Imaging has poured just as much resource and effort into delivering the same experience for facial capture.

Due to be officially launched at this month's Siggraph in Vancouver, the DI4D Head-Mounted Camera takes the company's experiences with high-definition performance capture and crams it into a rig that allows actors to move freely while performing.

"Our previous DI4D capture systems have required the actor to sit in front of a fixed array of video cameras," explains CEO Colin Urquhart. "Our new head-mounted camera system is different as it's a lightweight head rig that the actor wears.

"It's fitted with two small, synchronised, high resolution digital video cameras, allowing it to capture high quality stereo video of the actor's performance. The stereo video streams are then post-processed using our DI4D software. The system is therefore able to combine the high fidelity of DI4D facial performance capture with the freedom of movement

and convenience of untethered capture. The result is the capture of incredibly realistic, extremely dense, facial animation."

## FOUR HEAD

Dimensional Imaging is also keen to emphasise that the new, more portable solution is still capable of what the firm refers to as '4D facial performance capture'.

"Most facial performance capture systems either capture a single video stream which is interpreted to drive a rigged character model, or capture the 3D trajectories of only a sparse set of discrete facial markers," says Urquhart.

"By contrast, our 4D facial performance capture systems acquire a '3D scan' per frame using passive stereo photogrammetry and then a dense mesh is tracked through the sequence using optical flow. Every vertex in the tracked mesh then effectively becomes a motion capture marker. The result is much higher fidelity data."

The head rig is easily adjustable and lightweight for the actors' comfort. It also features four small LED lights that illuminate the face, helping the DI4D HMC capture data without the need for markers, make-up or special lighting.

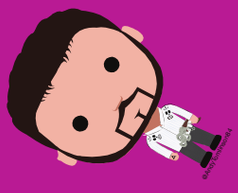
"The continuing demand for ever more true-to-life facial animation across the games industry is driving the need for ever higher fidelity facial mo-cap data," says Urquhart. "However, developers require tools that enable them to acquire this data in cost-effective and time-efficient ways."

To begin with, DI4D will be running an on-location service, managing the capture and processing of all data on behalf of the developers. Eventually, the firm plans to sell the device itself and licences for their software for studios to use in-house.

Devs can find out more or download sample data on the official website, or by contacting info@di4d.com. ■

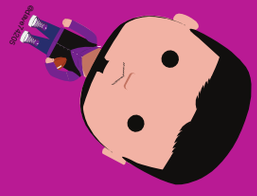
**DI4D Head-Mounted Camera**
**What is it?:** A head-mounted version of DI's high-definition DI4D facial performance capture solution. It enables devs to capture facial performances with similar fidelity to the sit-down system, but with far more freedom of movement.
**Company:** Dimensional Imaging
**www.di4d.com**

# Congratulations to the Develop Award winners from all the team at

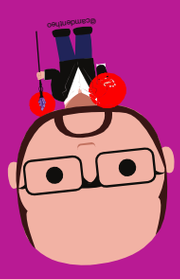


ukie

THE ASSOCIATION FOR UK INTERACTIVE ENTERTAINMENT



## Speak to sam@ukie.org.uk about being part of the family



HEARD ABOUT

# A sound connection

**John Broomhall** talks with Classic FM's Sam Jackson and Game Music Connect co-founder James Hannigan

*James Hannigan (above) and Classic FM's Sam Jackson (below). Main: Game Music Connect*

GAME MUSIC CONNECT'S inaugural event brought together a rich mix of video game composers, audio directors and music execs to discuss the art, technology and business of creating today's and tomorrow's soundtracks.

The organisation's co-founder James Hannigan says the aim of the event is to celebrate and explore the world of game music, offer a platform to the talent behind it and provide a forum for musicians to learn about working in the medium.

"Why do we have music in games? What does it exist to say?" he asks. "Should we be adopting the conventions and language of film and television? Should we return to unique 'old school' gaming values?

"Game Music Connect presents an opportunity for music creators to talk about the value their work adds to the gaming experiences which millions of people enjoy every day, as understood by them through the lens of personal experience."

## CLASS ACTS

As the event returns to London's famed arts hub, it not only boasts support from the likes of BAFTA, PlayStation and COOL Music, but also an impressive media partner in the shape of broadcasting giant Classic FM. But why is a classical music radio station getting behind Game Music Connect, and how do they view music for games?

"We believe we have a responsibility to grow the audience for classical music among a new generation of listeners," says Classic FM's Sam Jackson. "Playing game music is one such way of doing this. But we're also keen to profile the genre among our wider audience, giving them the opportunity to judge it on its merits.

"For music to be included on-air, we have to be confident that it will be popular with our audience. On a purely musical level, we take the same approach as we would with any other piece – whether that is a symphony, a film score, or something else entirely.

> ***"Classic FM's partnership proves that games music is being taken seriously by the public."***
>
> James Hannigan, Composer

"Essentially, is this good music which our listeners will really enjoy hearing? When it comes to the question of 'is this music classical?' – which is one we've been asked many times – and we would argue that video game soundtracks are an example of incidental music written for another art form. In the 1900s, that art form might have been ballet; in the 20th century, it could have been film scores; and today, it can be game music.

"Over the last few years, many gamers have voted video game soundtracks into the Classic FM Hall of Fame – the world's biggest annual survey of classical music tastes, which we count down every Easter weekend. There are two such soundtracks in the Top 20 alone and, having greatly increased the exposure given to this music on Classic FM in recent years, we now want to deepen our relationship with the people who work in the field."

## A GROWING APPRECIATION

Classic FM has also been experimenting beyond its Hall of Fame poll. The broadcaster runs several game music editions of '*Saturday Night at the Movies*' – aired on Saturdays between 5pm and 7pm, and presented by noted composer Howard Goodall. Broadening the scope of this show to include video game scores has prompted great reactions from both gamers and non-gamers alike.

According to Hannigan, this growing appreciation for the musical creations found in today's interactive entertainment titles is reflected in the interesting mix of delegates attending Game Music Connect.

"Year one demonstrated that the event draws a very diverse audience, fairly atypical of games industry events," he said. "We've seen soundtrack fans, musicians, aspiring composers and established industry figures sit side-by-side with academics, journalists and composers from other industries, which I think is a truly wonderful aspect of this outward looking event.

"This year, we're making an effort to be more inclusive than ever by inviting more speakers working within the independent games sector. Also, as part of our strong connection with the British Academy this year, Game Music Connect will also feature – among others – award-winning composer Garry Schyman, who won the Original Music BAFTA for his striking *BioShock Infinite* score.

Hannigan described the Classic FM media partnership as "an important breakthrough on several levels", expressing his gratitude for their involvement: "It provides yet more evidence that the music of games is at last being taken seriously by the public at large, the media and the music establishment."

Game Music Connect 2014 returns to The Purcell Room at London's Southbank Centre on September 24th. You can find out more at www.gamemusicconnect.com, and find Classic FM at www.classicfm.com. ■

**Game Music Connect**
**What is it?:** The event explores the music of video games and showcases the talent behind it.
**www.gamemusicconnect.com**

**John Broomhall** is a game audio specialist creating and directing music, sound and dialogue. Find him at:
**www.johnbroomhall.co.uk**

# Congratulations to all of the Develop Award winners

**Join us for coffee on the UK stand at Gamescom in Cologne, 11th – 15th August**

**Looking for next gen recruitment?**
Visit **amiqus.com** or call **01925 839700**

amiqus

UNREAL DIARIES

# The power to Rival gaming PCs

Epic Games dishes out more details on the stunning Rivalry demo for mobile devices unveiled at Google I/O 2014

*Epic's impressive Rivalry demo (above and below) is powered by the Tegra K1 mobile processor*

IN CONTRAST TO showing off the latest iOS capabilities on Apple's stage, as seen with the Unreal Engine 4-powered *Zen Garden* playthrough at WWDC, Epic Games recently launched a massive effort for Android when Google needed help demonstrating the graphics power of L, the upcoming release of its mobile OS Android.

Epic teamed up with the graphics and tech experts at Nvidia to meet the requirements, which held that the demo should run on an Nvidia Tegra K1 mobile processor and utilise the new features of AEP (Android Extension Pack), a set of APIs that extend the functionality of mobile graphics standard OpenGL ES 3.1.

In less than three weeks, Epic created the *Rivalry* demo. Set in the Reflections Showcase – which is free to developers subscribed to Unreal Engine 4 – the scene was originally built for a DirectX 11-class PC.

> ***"It's Unreal Engine 4, using the scalability options that desktop has. All of this, running on a Tegra K1."***
>
> Timothy Lottes, Epic Games

Epic and Nvidia ported the demo, along with new and original content, to Android and AEP. The *Rivalry* demo runs on the same high-end desktop rendering pipeline.

"It's the GL ES 3.1 AEP path running the DX11-based desktop UE4 engine," says Epic's senior rendering engineer Timothy Lottes. "Same crazy fat G-buffer, deferred shading, reflection probes, screen space reflections, temporal AA algorithm, and so forth, using the scalability options that desktop has. All of this, running on a Tegra K1."

Google, Epic and Nvidia are providing all the tools developers need to build incredible games for Android devices. AEP adds powerful new extensions to OpenGL ES, bringing PC and console-class features, including tessellation and compute shaders, to Android.

Epic is releasing its work in real-time through the Unreal Engine source code hosted on GitHub, plus free demo content is regularly being pushed to subscribers.

For more information, visit www.unrealengine.com. You can also check out Epic's archive of Twitch broadcasts at www.youtube.com/UnrealEngine. ■

## UPCOMING EPIC ATTENDED EVENTS

**SIGGRAPH**
August 10th to 14th
*Vancouver, Canada*

**GDC Europe**
August 11th to 13th
*Cologne, Germany*

**Gamescom**
August 13th to 17th
*Cologne, Germany*

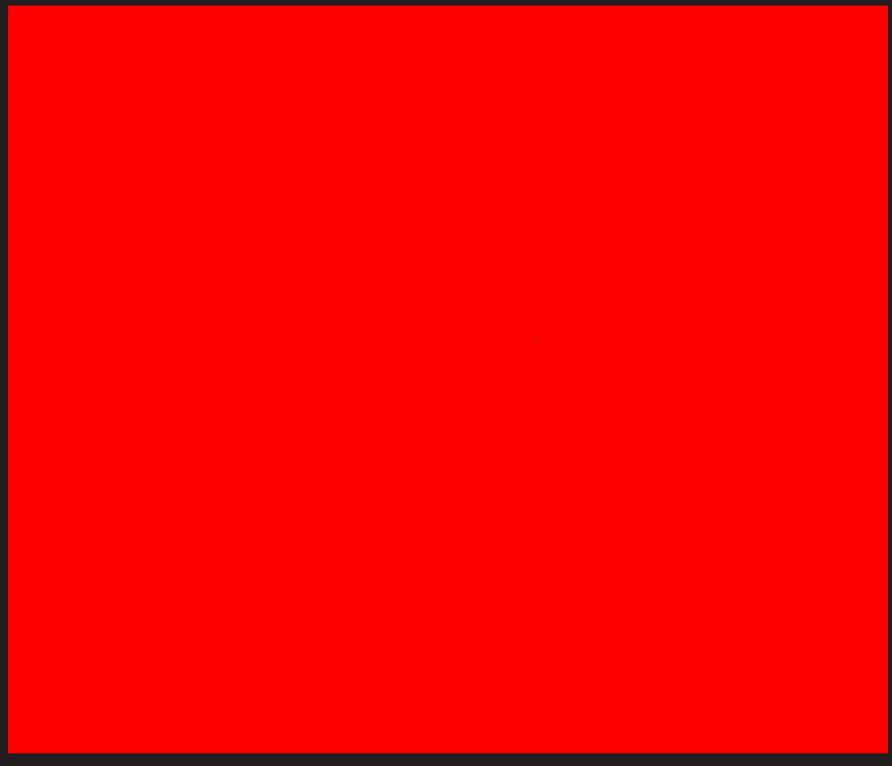
*Email **licensing@epicgames.com** for appointments and sign up for Epic's newsletter at unrealengine.com.*

Epic is hiring. To find out more visit: **epicgames.com/careers**

**FOR MORE SUCCESS STORIES, VISIT:** UNREALENGINE.COM/SHOWCASE

Congratulations to all of the Develop Awards nominees and winners!

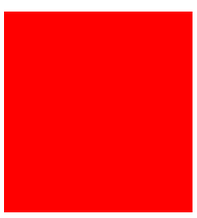
We wish you continued success.



UNITY FOCUS

# Lighting up space

N-Fusion's art director Carissa Isolano reveals the Unity plugins and features that helped create Space Noir

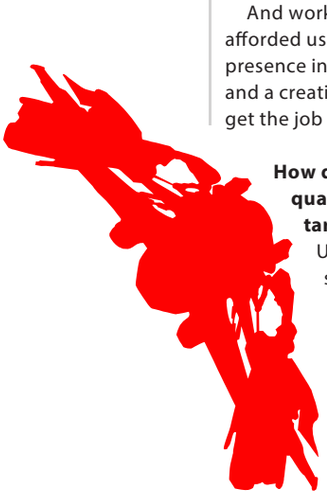


*N-Fusion's Carissa Isolano (above) says Unity's flexibility ensure it could experiment and quickly iterate on Space Noir's (main) graphical design*

**Why choose Unity for *Space Noir*?**
We chose Unity for *Space Noir* as it has become our engine of choice. Its flexibility is great and the entire team is familiar with the engine, which makes it easier for us to iterate quickly. We always knew *Space Noir* needed to be a beautiful, graphically high-end game, and we needed to allow our artists to experiment and quickly iterate on their work.

Being able to view in real-time, and have access to some of the industry's newest tech, has really enabled us to push the boundaries of what our team would have been able to accomplish elsewhere. Unity has also allowed us to not be bound to a particular platform, and the usual restrictions that come with adapting to the hardware for it.

And working with Unity Games has afforded us a larger presence in the marketplace and a creative freedom to get the job done right.



**How did you accomplish the visual quality of the game, given that it's targeted at mobile platforms?**
Unity has allowed us access to some great features both inside the engine and via plugins. Our game was built from the ground up using Marmoset Skyshop, which is available in the Unity Asset Store. This has helped to quickly unify all of the assets in a scene within just a few moments of setup, and the results are truly amazing. It allowed us to focus on generating new assets while still maintaining the same overall look and feel to every material added.

We also made use of Shader Forge, which enabled us to create new shaders extremely easily and rapidly. This, mixed with the Unity engine's huge array of post-processing features, really helped to create a unified theme to our game that comes off as feeling very crisp and polished.

> ***Marmoset Skyshop helped to quickly unify all of the assets in a scene within a few moments of setup.***
>
> Carissa Isolano, N-Fusion

**What other features on Unity were useful?**
Something new we were able to explore was Asset Data. This played a large part in streamlining the integration of the many enemies, bosses, and weapons, as well as the live tweaking and balancing of the game.

We also wanted to ensure a large view distance in our game, and making use of Unity's easy to use Level Of Detail system has worked out great to this end. You can view our entire worlds with no need to clip out far away geometry, and it makes for some great views. Mecanim allowed us to efficiently control our animations, and get the most out out of them with re-targeting across our biped characters.

**Which features would you like to see added in future versions of Unity?**
We'd like to see better source control support as that is a constant frustration for us. A cinematic editor would be very useful as well.

A lot of our favourite features also come from the plugins we have used to supplement the engine, and some of these are very worthy of being integrated into the engine itself. ■

**Space Noir**
**Developer:** N-Fusion
**Platform:** Android iOS, PC
**www.n-fusion.com**

PITBULL BYTES

# The changing role of C/C++

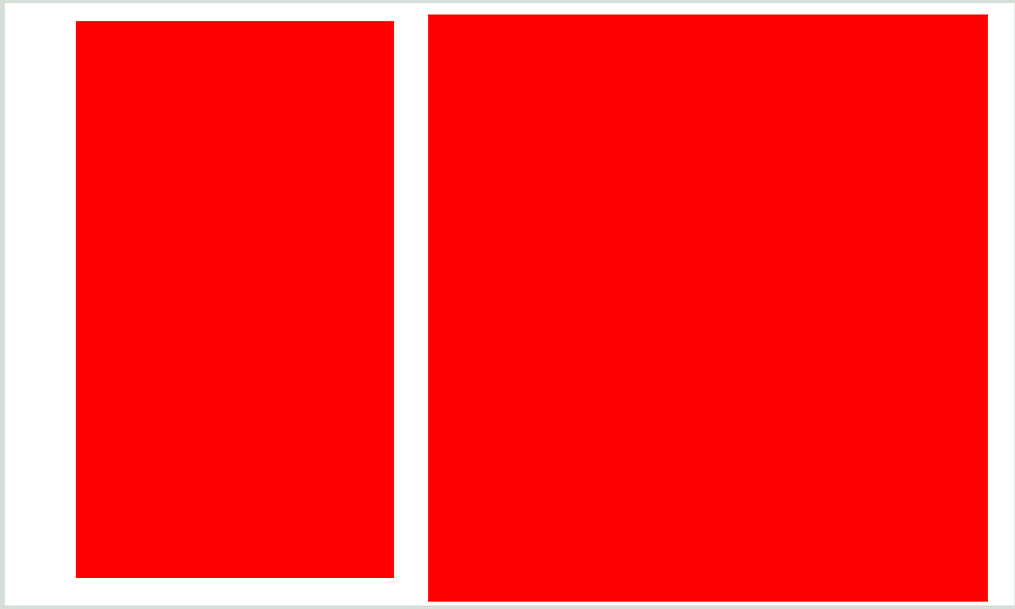
**Steve Robb** ponders the recent history of a once ubiquitous coding language

IN THE PSONE, Saturn and Nintendo 64 era, C was the dominant language. C compilers were in the toolchains of all platforms. The hardware APIs were in C.

Expectations, designs, team sizes, timescales and costs were all growing. It wasn't feasible to rewrite a game for every platform, nor was it possible to hire huge numbers of programmers familiar with the hardware for every system.

C had long been established as efficient and portable, including to future systems. Hardware still differed, but it was now fast, similar and capable enough of abstracting game logic from platform concerns without significant cost. Assembly would still be used for performance-critical areas behind the abstraction layer.

Even certain C features tended to be avoided. Heap allocation was often outlawed after program initialisation due to performance/determinism concerns, and real numbers were represented in fixed point instead of floating point due to most platforms' lack of a dedicated FPU.



## LEVEL UP

The PS2, Xbox and GameCube era saw a shift to C++. Higher quality compilers were becoming available, with a desire to use language features to improve programmer productivity expression. Graduates were coming into the industry with C++ knowledge.

However, this move wasn't greeted with open arms. Performance-critical areas like rendering and physics often remained in C, ported over from older codebases. Some resented wasting cycles on anything beyond the platform abstraction. Some said C++ obfuscated the compiled code. Some disliked the syntax. Some saw no need for new language features. Each concern had validity, but the shift was inevitable.

The amount of C++ used varied, but tended to be based around basic inheritance and virtual functions. Floating point was finally available to all, but some games still outlawed the use of heap allocation after start-up, requiring the use of arena-based allocations or fixed capacity containers. Virtual functions were used but the small caches available on PS2 meant penalties on every dynamic dispatch to load objects vptrs and vtables.

Experiments with templates began, tempered by fears of code bloat. Careful design with the kind of type aliasing tricks you would find in C (later to be formalised as 'type erasure') would mitigate some of that, but template (mis)use tended to produce the most friction in teams.

## THE ARRIVAL OF MULTIPROCESSING

In the PS3, Xbox 360 era, C++ was prevalent. C still had its role, but middleware libraries tended to expose C++ APIs, and engines and games were in C++.

> ***"Some saw no need for C++'s new language features, but the shift was inevitable."***
>
> Steve Robb, Pitbull

Few of C++'s features seemed to be off-limit – though exceptions and RTTI were still notably absent due to their runtime cost. Templates began to dominate codebases and compile and link times would suffer as a result, thanks to the compilation model inherited from C.

With multiprocessing now commonplace, work would get farmed off to other systems to run concurrently. This freed up the CPU to do more game logic in script languages for higher productivity, as the hardware was now capable of hosting embedded interpreters alongside its other work. Scripts could be reloaded on the fly, or at worst require a restart, rather than a slow build/link step.

Now, it seems nothing is taboo. The growth of powerful mobile devices and the flood of quality, cheap engines have seen games being written from scratch in all kinds of languages. C++'s CPU speed advantage is shifting towards compute shaders and the CPU becoming more of a task manager. Less game logic is being written in C++, the need to count bytes and cycles becoming increasingly redundant.

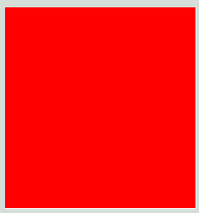
## TODAY, AND THE FUTURE

So where does C/C++'s future lie? Engines will continue to strive for optimality. The C ABI has settled on being the de-facto for any new native system, and C/C++ compilers are available on every mainstream platform, allowing the creation of (mostly) portable code which runs natively without any runtime penalty.

C++ itself is moving in a different direction. Many languages are satisfied to express object-orientation in varying syntaxes but C++'s embrace of value semantics and generic programming is relatively unique, providing type-rich codebases where types encapsulate intent and programs do the best thing because the type system knows how components are assembled. It is also being positioned as giving the most performance per watt – important in a world increasingly concerned with reducing its power usage.

Now, if only they could fix those damn compile times... ■

**www.pitbullstudio.co.uk**



*Pitbull Studio senior programmer Steve Robb says that C++ became more prevalent with the rise of multiprocessing*

*Main: The programming language has evolved just as home consoles and other gaming formats have*

# THE DEVELOP QUIZ

## It's on the move

The next Develop Quiz is headed to Newcastle

*Sponsored by*

**September 3rd**

The Charles Grey,
Newcastle-upon-Tyne

**To book your table please contact:**
Kathryn.Humphrey@intentmedia.co.uk

**For sponsorship opportunities please contact:**
Alex.Boucher@intentmedia.co.uk

Find your nearest quiz at: **www.develop-online.net**

# DIRECTORY

**The world's premier listing of games development studios, tools, outsourcing specialists, services and courses...**

**SERVICES SPOTLIGHT:**
Server hosting provider LeaseWeb
p80

**TOOLS SPOTLIGHT:**
Development framework Fabric
p81

## KEY CONTACTS

| | |
|---|---|
| Digital Design Studio | www.gsa.ac.uk/dds |
| Epic Games | epicgames.com/careers |
| Eutechnyx | eutechnyx.com |
| Datascope | datascope.co.uk |

develop DIRECTORY

**GREAT ADVERTISING OPPORTUNITIES**

**RATES**
1/4 page: £450
(or £200/month if booked for a minimum of six months)

**CONTACT:**
**Alex.Boucher@intentmedia.co.uk**

**T: 01992 535 647**

# SERVICES SPOTLIGHT

This month: **LeaseWeb**

**LeaseWeb**
LeaseWeb Netherlands B.V.
Luttenbergweg 8
1101 EC Amsterdam
The Netherlands

**T:** +31 20 316 2880
**E:** sales@leaseweb.com
**W:** www.leaseweb.com

LEASEWEB PROVIDES DEVELOPERS with an array of server-side and hybrid infrastructure solutions, offering products such as colocation, bare metal services, a public and private cloud and a content delivery network.

Its services are connected to a global network with more than 4.0 tbps bandwidth capacity so servers can cope with stress put on them by devs and players.

LeaseWeb clients include the likes of Ubisoft, CCP, SEGA, Tencent, Kabam and Goodgame Studios.

Global business development manager for gaming Paul Grimwood (*pictured*) says its hosting solutions can be configured, deployed and managed from anywhere in the world, and promises low-latency and 24 hour support for customers.

"This means that games developers can easily combine LeaseWeb's infrastructure as a service (IaaS) solutions, which are available with flexible short-term contracts, to reduce financial risk and meet market demand as accurately as possible," he says.

"This is especially important in F2P, as many games firms are often left over-provisioned and financially strained on a CAPEX/colocation-only model."

The issue of offering sturdy servers to handle high influx of users, particularly at the start of a game's lifespan, has become an increasingly hot topic of debate in the games industry.

As the launch of EA's online-focused *SimCity* has shown, predicting user numbers at launch can be tricky, and can also prove disastrous for a title's reputation if the problem persists.

"After the initial rush of players, some people continue to play the game on a daily basis, while others leave," he says. "Gaming companies often spend millions on hardware to have enough capacity at launch, but do not include an option to quickly scale up or down afterwards.

> ***"Companies often spend millions to have enough capacity at launch, but can't scale quickly after."***
>
> Paul Grimwood, LeaseWeb

"This is why flexible hybrid infrastructure solutions are of utmost importance to a games studio's strategy. A good IaaS provider can also advise which of its services are most applicable to specific types of online games, ensuring that a developer can focus on what they want: creating excellent games." ■

*LeaseWeb offers a vast array of hosting and cloud services to ensure games stay online*

**Digital Design Studio** www.gsa.ac.uk/dds

**Epic Games** www.epicgames.com/careers

# TOOLS SPOTLIGHT

This month: **Fabric Engine**

**Fabric Software**
420 Rue Guy
Montreal Quebec H3J 2L2
Canada

**E:** sales@fabricengine.com
**W:** www.fabricengine.com

UNIQUE IN MANY respects, the Fabric Engine is a development framework for building custom tools, such as for scene assembly, rigging and animation, lighting and 2D image processing.

It's designed for technical artists and designers familiar with scripting languages such as Python, JavaScript, MEL and MaxScript, but who don't normally work in C++.

Fabric Engine CEO Paul Doyle says it can also be used by R&D teams in larger studios who work in C++ but want to work with an existing framework, rather than developing standard components from scratch.

"Fabric Engine's programming language KL is familiar to developers who work with Python or JavaScript; because Fabric's core engine automates multi-threading, memory management, and platform specific programing," he says. "Using the Fabric Splice API, developers can create tools within a familiar digital content creation (DCC) application, and then port Fabric tools to other DCCs as well as renderers or their in-house custom dependency graphs; they can also build and use tools in the standalone Fabric framework."

> ***"Fabric Engine's programming language KL is familiar to developers who work with Python or JavaScript."***
>
> Paul Doyle, Fabric Software

The 1.13 update includes a new GPU compute feature that enables code to be executed on both the CPU and GPU without the need for additional coding, meaning developers don't have to write separate code for the GPU and then test their tools to see where they run faster.

Fabric Engine has also just announced a new visual programming feature, to be shown at Siggraph. This is designed to make the tool easier to learn and use.

"We hope to have it – as part of Fabric Engine 2.0 – ready for release by the end of the year," Doyle says.

The tech was recently voted 52nd in the Develop 100 Tech list ranking the top tech and tools in games. ■

*Fabric Engine is being updated with a visual programming interface designed to make the tool easier to use and learn for artists and designers*

**Eutechnyx** **www.eutechnyx.com**

**Datascope** **www.datascope.co.uk**

amiqus
recruitment specialists
for the games industry

# THE FAQ PAGE: TOBY MOORE

Develop grills respected figures from the global games industry

*As a fan of RTS and sci-fi Space Ape Games CTO and co-founder Toby Moore's favourite game is Relic's classic Homeworld*

**Who are you and what do you do?**
Toby Moore, CTO and Co-Founder of Space Ape Games. I help run the business from a technical point of view, working with the teams to make sure we've got the best technology stack and processes in the industry to build games on.

**What are you working on right now?**
Growing *Samurai Siege* and building out our live events capabilities, as well as working on our top secret new game, and a bunch of R&D.

**What was the first video game or product that you ever worked on in the industry?**
I joined the gaming industry quite late, starting with Mind Candy working on *Perplex City*, an alternate reality game that mixed technology with games and live events. Ultimately it wasn't successful, but it was an amazing experience.

**What was the first video game you ever played, and did you enjoy it?**
I think it was *Paper Boy* on the ZX spectrum. It was a lot of fun, once it loaded.

**What was the most recent video game you have played, and did you enjoy it?**
It was Supergiant Games' *Bastion* and yes, it's really enjoyable to play. It has great twitchy gameplay and all the art and production values in the game are excellent.

**What is your favourite game ever, and for what reason?**
I think it's probably Relic Entertainment's *Homeworld*. I love real-time strategy and sci-fi, and they nailed it along with a very emotional storyline and great artist production.

**How many hours a week do you spend playing video games?**
I'm privileged enough to be able to justify playing games as part of my job, but still not as much as I'd like. Probably about 15 hours. I'm part of a core group of Apes that play *Ultra Street Fighter IV* most evenings.

**What area of the industry do you think needs more 'investment'?**
I think game discovery on platform app stores needs more investment by the platform owners. It's really hard to get good games in front of people that want to play them, especially for independent studios.

> ***"It always makes me sad to hear about people pouring their lives into projects that get canned."***

**What do you enjoy about the video games industry today?**
The video games industry is such an amazing fusion of art and technology. I get to hang out with brilliant engineers and artists all day and I'm constantly wowed by what people can achieve when they're doing something they love. The passion at work is unrivalled anywhere else.

**What disappoints you about the video games industry today?**
I've hired a lot of people from studios that have shut down due to bad management, and it always makes me sad to hear about teams of amazing people pouring their lives into projects that get canned for bureaucratic reasons or company mismanagement.

**Of all the games you've worked on, which of them has been your favourite?**
I have to say *Call:It, Football*, Space Ape's first title. We were facing a huge task of building both a company and a whole new way of experiencing live sports at the same time. It was very blue ocean, very technically challenging and the team came together in a really great way. It's not easy making a game that you can only test at 3am in the morning when the NFL is on.

**What game that you were not involved with would you most liked to have worked on?**
The making and growth of *World Of Warcraft* would have been an amazing experience.

**What other video games developer do you most admire?**
I really like the team over at Riot Games; their dedication to their users along with their humility is really impressive. I've met a few Rioters and they're a great bunch.

**What hobbies, collections or interests do you have that are completely unrelated to video games?**
I love travelling, snowboarding, scuba diving, black and white photography and I tend to spend a lot of time reading about eastern philosophy and psychology.

amiqus Discover a global network of talent today at amiqus.com

develop
THE INTERNATIONAL MONTHLY FOR GAMES PROGRAMMERS, ARTISTS, MUSICIANS AND PRODUCERS

Publisher
**Michael French**
michael.french@intentmedia.co.uk

Editor
**James Batchelor**
james.batchelor@intentmedia.co.uk

Deputy Editor
**Craig Chapple**
craig.chapple@intentmedia.co.uk

Contributing Editor
**Will Freeman**
will.freeman@intentmedia.co.uk

Sales Manager
**Alex Boucher**
alex.boucher@intentmedia.co.uk

Designer
**Philip Randall**
philip.randall@intentmedia.co.uk

Production Executive
**Florence Beaumont**
florence.beaumont@intentmedia.co.uk

**Contributors**
Alex Calvin, Alex Ward, John Broomhall, Nick Gibson, Peter Clapperton, Seth Steiling, Simon Elms, Steve Robb

IntentMedia
Intent Media is a member of the Periodical Publishers Associations

**CIRCULATION IS OVER 8,000**

**Tel:** 01992 535646 **Fax:** 01992 535648 **Web:** www.develop-online.net

© Intent Media 2014 All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means electronic or mechanical, including photocopying, recording or any information storage or retrieval system without the express prior written consent of the publisher. The contents of Develop are subject to reproduction in information storage and retrieval systems. Printed by Pensord, Tram Road, Pontllanfraith, NP12 2YHA

**Subscription** UK: £35 Europe: £50 Rest of World: £70

**Enquiries, please email: dev.subscriptions@c-cms.com Tel: 01580 883 848**

Charges cover 11 issues and 1st class postage or airmail dispatch for overseas subscribers

**Develop is published 11 times a year, reaching 8,000 readers throughout the UK and international market**

## GROWTH & EXPANSION

We have numerous projects on a wide array of platforms in development, which means we need seriously talented people to help create some fantastic games. As such we've gradually and carefully expanded with some of the world's most gifted developers. New people mean new facilities and we're now situated across three floors in our well-equipped studio.

## LOCATION, LOCATION, LOCATION

We've been in Horsham, West Sussex from the beginning and we're very happy that's the case. We're ideally placed for games professionals at all stages of their lives and careers; situated within easy commuting distance of the bright lights of bustling London and cosmopolitan Brighton. For those looking for something more relaxed, Horsham and the surrounding area offer beautiful countryside, outdoor pursuits, great restaurants and shopping and some of the best schools in the UK for family-focused professionals.

## THE BENEFITS

We regularly benchmark ourselves against the wider industry and we have one of the best packages in the business. Benefits such as private healthcare and dental cover for employees and their families, life insurance, pension scheme and an annual bonus based on personal and studio performance. Other benefits such as onsite massage therapy, fully loaded SEGA Steam accounts, regular parties and social events, and awesome CA brand apparel and merchandise help make up those all-important perks.

## BUILDING FOR THE FUTURE

It's vital for us to prepare for the future. Whether that's investment in people via training and talent acquisition, developing our own internal IP and technology, or collaborating with external agencies and IP holders to forge strong and valued relationships.

As well as the continued evolution of our world-renowned Total War™ series, with moves into digital and MOBA titles, we've also taken steps to align ourselves with some of the most exciting franchises in the world, such as Twentieth Century Fox's Alien™ and Games Workshop's Warhammer® IP. This enables us to broaden our appeal to the game-playing public, allows us the freedom to try new things and gives our teams lots of incredible source material to work with.

## MAKE YOUR OWN HISTORY WITH US

We're always on the lookout for fantastic professionals to join our family, so even if you don't see a position advertised on our site that is suited to you, we still want to hear from you! Our team review all applications submitted, whether for specific roles or speculatively. Even if you're not looking for work right now it's good to stay in touch with us, as we will likely need your skills in the future! So go on, send us your CV and make us an offer we can't refuse.

**WWW.CREATIVE-ASSEMBLY.COM**

CREATIVE ASSEMBLY™

WWW.CREATIVE-ASSEMBLY.COM

© SEGA. Creative Assembly, the Creative Assembly logo, Total War and the Total War logo are either registered trade marks or trade marks of The Creative Assembly Limited. SEGA and the SEGA logo are either registered trade marks or trade marks of SEGA Corporation. All rights reserved. Copyright © Games Workshop Limited 2014. Warhammer, the foregoing marks' respective logos and all associated marks, are either ®, TM and/or © Games Workshop Ltd 2000-2014, variably registered in the UK and other countries around the world, and used under license. All rights reserved. Alien: Isolation, Alien, Aliens, Alien 3 TM & © 2014 Twentieth Century Fox Film Corporation. All rights reserved. Twentieth Century Fox, Alien, Aliens, Alien 3 and their associated logos are registered trade marks or trade marks of Twentieth Century Fox Film Corporation. Alien: Isolation game software, excluding Twentieth Century Fox elements.